

Movement & Vitality
The Remarkable Human Creature
Philosophical & Biological Implications of Moving

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(7/17/17) this is the final version. It includes an appendix that needs to be eliminated. this book does not make reference to religion ... purposely so.

Notes for revision and completion (9/24/17):

1. Rewrite in style for general reader, not academic
 - a. Start w/ Moving Chapter: outline the chapter and then rewrite.
 - b. Should begin with the issues of true/false, real/fantasy, story, fiction, mythology, etc. Is it just solipsism that we often believe that something is true when others think it is false, or worse, a lie? What is the nature of creativity and novelty? Why have religions been based on incredulous stories and beliefs (Adam and Eve good example), why do kids love stories, especially fantasies? Think of the unreality of cartoons and anime?
 - c. Then consider the options: objectivism or subjectivism (solipsism), science and rationality,
 - d. Approach is to center on distinctiveness of humans: biology and philosophy
2. Theme throughout is to develop in biological and philosophical grounds the foundation in self-movement for an aesthetic of impossibles; for stories; for play; these are the core of vitality (the energetics of life)
3. What is distinct to human animate organisms is of a package that has as forte the delight in nonlinearity and metastability
4. Incorporate in some of the present chapters discussions of applications like aesthetic of impossibles, story, lie/fact, fantasy, etc. Some of these can come from the whole last section that has more to do w/ religion.
5. In Smooth Movement add the geometrical shapes of dancers' bodies.
<https://www.facebook.com/universaldancebr/videos/1971772456400073/> and also da Vinci's body in geometric figure ... and the Golden Mean
- 6.

Abstract

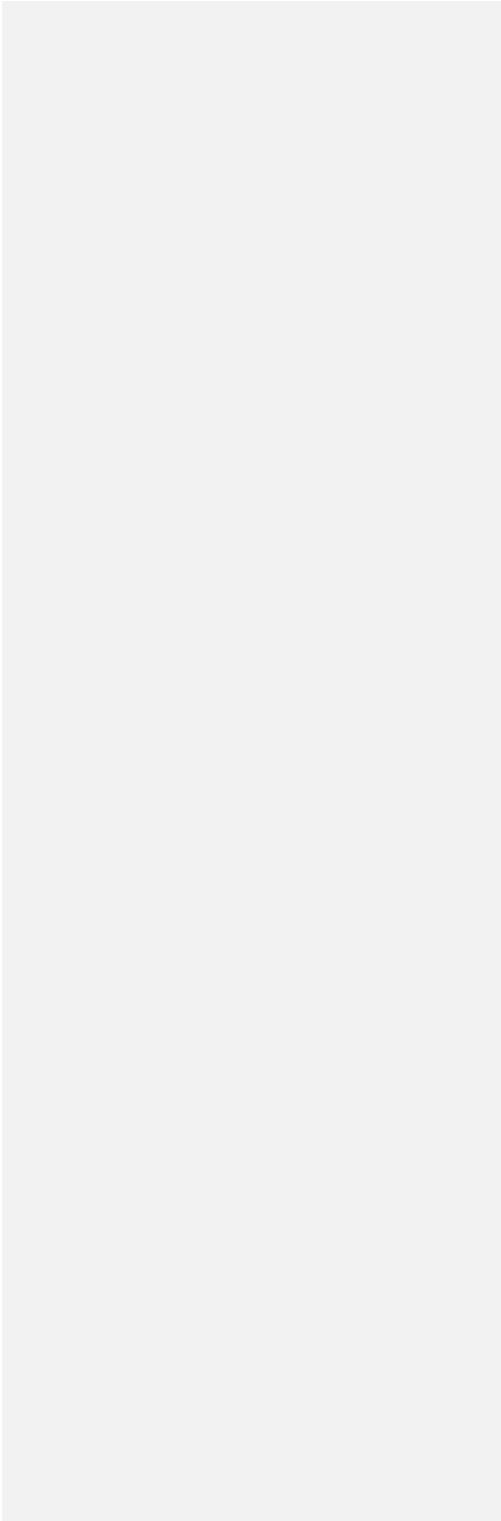


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169,000 words

Preface

It has become fashionable for academic humanities research to focus on “body” perhaps an antidote to the over-emphasis on mind, yet “academic” continues to infer a near synonym with “mind.” While studies continue to open new perspectives for expanding our understanding of perception, cognition, agency, practice, action, experience, it is increasingly clear that advancements will be limited so long as the body and mind/brain are separated, isolated, or vying for primacy. Based on a quarter century of academic research coupled with extensive practice dancing and moving, I have experienced a primacy of movement. Movement understood both neurobiologically and philosophically precedes the mind/body distinction and opposition that has long shaped western culture, religion, and thought. While regularly implicated, the importance of movement is rarely foregrounded in the finest studies of perception, cognitive science, agency, cultural and religious practice, and philosophy. By focusing first on movement especially self-movement—neurobiologically based movement—I am engaging by the implications that unfold from this alternative to attempting to integrate mind and body or to resolve the mind/body problem. From this movement perspective distinctions between nervous and muscle systems, between brain (central nervous system) and body (peripheral nervous system and skeletal muscular systems), arise not in opposition competing for primacy, but rather in service to the comprehension of the living moving organism.

I am a religion scholar having studied religion in one context or another for decades. Early decades were dedicated to Native American religions then I turned to focus more directly on broader issues of the study of religion including ritual, masking, performance, art, and religion theory before finally turning full intensity to the study of dancing. In this period I found myself interested in cultures all over the world: Australian Aboriginal traditions, several African cultures, Bali and Java in Southeast Asia, and several cultures in Latin America. I wrote about the broader comparative and theoretical concerns encountered by the study of religion and the study of dancing.

As my interests shifted to dancing and dancing became a personal passion, I mostly left these religious studies issues behind to think about so many other concerns. I did so dancing and studying dancing in cultures across the globe. My interests were far more in feeding my experiential passions than in writing about anything at all. As a result for much of two decades my academic publication was occasional while my writing was extensive but personal and used mostly as a technique to further my own self-moving development. Dancing, moving, writing became gestural practices for me, not the performance of my job or the methods of my research. I never gave this development a thought other than when annually reprimanded by my colleagues for yet again not meeting minimum publication requirements. Still, this period was the most important in my life (even my academic life) because it re-formed me totally and it did so at the very level of tissue; I’m not being hyperbolic. I came out of that having been formed not by academic traditions and mentors and disciplines and bibliographies (although all these are retained somewhere in the new mix), but trained by self-moving, by gesturing in distinctly identifiable ways, by allowing the primacy of self-moving to be experienced and to resound throughout what is also obvious, that I am (humans are) most fundamentally moving body; I am not embodied as in existing elsewhere but equipped with a body like an accessory.

Comment [1]: Maybe drop this ... am pretty sure it isn't the tone I want now anyway.

Perhaps as this self-movement established itself deeply enough in my gestural identity I have found myself able and eager to return to academic writing and research with renewed passion and a burgeoning agenda. Yet, all of what I do now is shaped most distinctly by my own self-moving and by my research focused on self-moving. Of course, where I move now can allow me to see that certainly all academic writing is equally shaped by self-moving; my only claim to distinction is the relative extent to which I have allowed self-moving to be more directly explored and that my attention is focused on self-moving and the consequent boundless implications.

Dancing Culture Religion (2012) developed an understanding of dancing—dancing rather than dance—that serves as the foundation for both the comparative study of cultures and religions around the world and also for the exploration of how dancing exhibits and affords experience of the ontogenetic forces of human life. Beginning with movement, then developing dancing as gesture, I go on to consider dancing as “self-othering” (my own term, mostly), playing, and seducing.

Religion: Always Already the Moving Body (under consideration by Oxford University Press) develops an account (rather than a theory) of religion that begins with the primacy of self-movement and goes on to discuss the most distinctive features of religions—myth, ritual, theology—in the context of religious perception, experience, knowing. The resulting account foregrounds the importance of experience, repetition, the impossibilities that distinguish myth and theology, to show how these features do not present themselves to be resolved, but rather function to energize and vitalize religions and establish the basis for building lived religious identities. This account of religion avoids the view, common to both academics and the general public, that “religion is good,” that it soothes and comforts and brings joy and answers to confounding questions. *Religion* engages in critical discourse with some of the leading theories of religion. *Religion* shares much with this volume in terms of grounding human distinctiveness in movement, the common core of animate organisms.

What I originally had in mind when I set out to write this book, *Movement*, was to focus on the five human senses and to argue for a sixth sense, proprioception or a kinesthetic sense, that, if included, would reshape the way we understand the other five senses. Such a movement approach to the senses would then, I believed, offer an exciting and refreshing way of understanding perception and the various channels of perception. I continue to hold these original objectives, yet, in the process of the research and the development of writing, I discovered that a good many of the authors I found most powerful and insightful—Maxine Sheets-Johnstone, Renaud Barbaras, Maurice Merleau-Ponty, Michel Serres, Brian Massumi, Gerald Edelman—all tended to find themselves gravitating in their writings towards an awareness that as they were writing about movement, perception, knowing in philosophical and biological terms, they were ultimately writing about life, about vitality, life writ large. As this larger concern arose and became more urgent and central, my original consideration of the five senses separately was subsumed and wound up in a supporting role to the pursuit of my interest in vitality as it is inseparable from moving. Much of my original objective can be found now in the “Body” chapter. I have also purposefully avoided much reference to religion and religions, because I want to consider

Comment [S2]:

the issues I find interesting in the broader more engaging discourse of philosophy and science.

“Vitality” may be something of an old fashioned word or it may risk invoking something more in the area of new age health consciousness and lifestyle movements; don’t mind being old fashioned, yet I have little tolerance for much of the New Age. I remain attracted to the word because it indicates both the distinction of the living from the non-living, that is, aliveness, as well as also suggesting the force or an energetics that may differ even among the living, that is verve. This term encourages us to think about processes and forces rather than criteria or attributes. The root term “vital” is also commonly used to indicate urgency, as in something essential and unquestionably important.

Another strange thing occurred to me as I did the research for this book. Most of my work has been set in the context of deeply believing that self-movement has primacy and offers a remarkably important perspective for the study of perception and knowing and so much more. Most of the materials I encountered in research set “philosophy” (a loosely defined term to refer to an approach that is based more on reflection than on laboratory procedures) and “science” at odds with each other; seemingly a natural opposition that unquestionably reflects the “objective nature” of things. Most studies are clearly identified as either “philosophy” or “science,” yet a few attempt to relate the two or to be inclusive of the two. The common opposition seems to me to parallel the common opposition of mind and body; not, in my view, a problem to be resolved, but rather the product of an approach for which I want to offer an alternative. To reject that these two perspectives/approaches are even distinct much less in opposition is rare. However, my interests constantly took me to both (and any) areas of study without even my being always much aware of which yard I was playing in. As I read science I was thrilled with the insights and findings as well as their motivating questions and engagement these works offer to the ideas and concerns I experienced as emerging and growing. So also with philosophy. More than anything I experienced style differences and that some writings include different kinds of illustrations and symbolics. Though I don’t have the patience to do controlled experiments or laboratory or field studies, I think they are remarkably important. Though I don’t have the fullest classical background in philosophy, I think it is constantly valuable and is itself self-renewing as it is brought into the presence of contemporary concerns. Though I have but an undergrad degree in math with a physics minor—and surely the great bulk of mathematical and physics knowledge today has developed since I graduated—I certainly am not qualified to converse in technical details with contemporary scientists, yet I have to admit that I just don’t see why there should be separation or opposition among these approaches. I do not think that scientific procedures and studies are anything like “objective” even if they represent their results to three decimal points and use complex mathematical representations. I also don’t think that philosophy is “mere metaphor” or “unsupported thought.” The two differ primarily in terms of style. I appreciate both and am rarely much aware of which I am benefitting from. In understand neither at all fully and I take it that this is core to ongoing inquiry and creativity. So this book simply had to carry a subtitle that would be as honestly descriptive as possible; although I recognize that in the conjoined terms I’m acknowledging a separation commonly held by others but not of much importance to me. Not wanting to locate myself solidly in either of these “styles”—indeed, I am not adequately qualified in either—I wanted to attempt to at least suggest the

Comment [S3]: Consider different subtitle or even title: Movement and Vitality

conjunctive (more than that really because of the absence of boundaries) experience I have had and hopefully something of a conjunctive style by choosing *A Philosophical Neurobiology of Movement*.

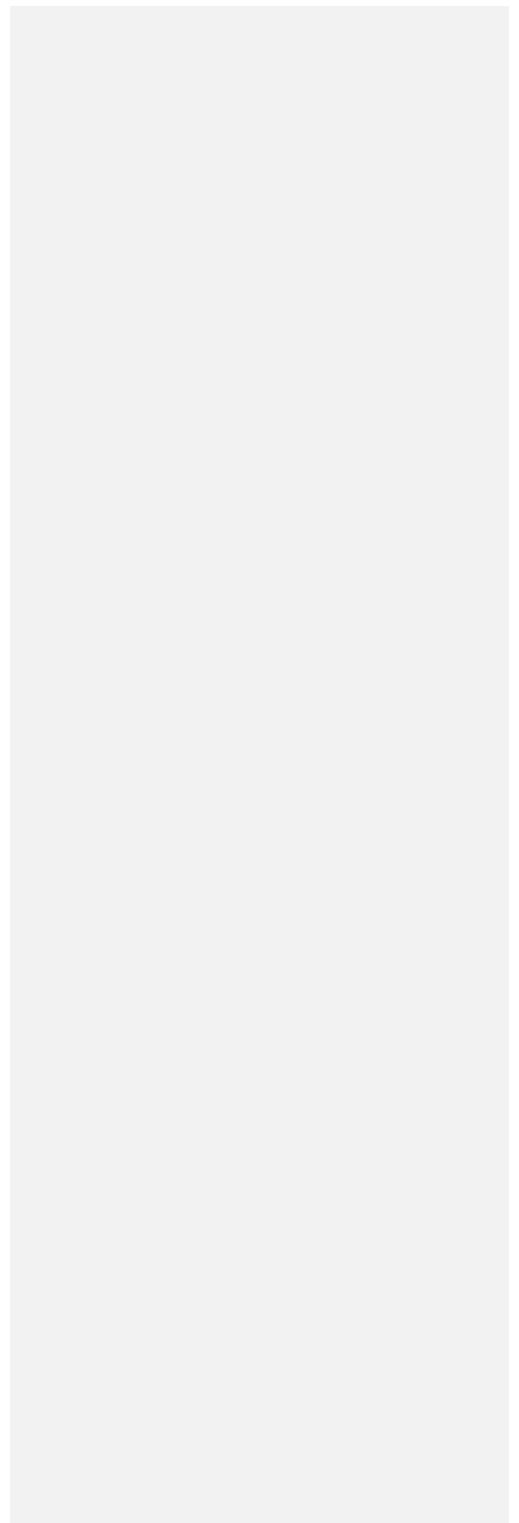
Comment [S4]: Continuing previous note

The mandate for a forthcoming book *Gesture Posture Prosthesis* emerged while writing a 20,000-word paper as the basis for a 2013 lecture at Stanford University. It will explore gesture (techniques of body shaped by culture, history, and psychology), posture (the physical and cognitive tonal basis for gesture), and prosthesis (gestural extension beyond physical body, a kind of lateral transcendence)—all aspects of self-movement/touch—as comprising a nexus in which each term co-implicates the other two. The gesture posture prosthesis nexus articulates principles and strategies for understanding and interpreting actions, experience, and material objects more directly without dependency on texts to provide explanation. This approach advances beyond our logo-centric academic environment in which we have had limited theories and methods allowing us to give “voice” to these skilled aspects of life.

Among my various writings on moving, this work is focused on the essential connection between moving and vitality.

Acknowledgements

New Opening Chapter



1 Moving

Moving is vital force manifesting. The advent of life as well as the ongoing process of living is moving, self-moving. Animate organisms, to use Edmund Husserl's term, do not acquire movement; they do not exist as animate organisms apart from movement. Moving is not something that appears at a certain stage or is a mere attribute of animate organisms; moving is the essence of animate organism; the two words of the term are nearly redundant and each synonymous with moving. Renaud Barbaras put it this way, "It is quite intrinsic to movement that it does not and cannot arise from something foreign to it; movement is not a mere contingent modality; it is not possible to enter into a sphere of movement if one is not already in it."¹ Seemingly, should one need to acquire movement, one would have to move to do the acquiring.

Nothing moves without the physical contained mass, the body of the organism. The moving cannot occur apart from the ridiculously complex and seemingly impossible coordination of the vast constituents that comprise the organism: muscles, bones, neurons, and sensory receptors in all their chemical, mechanical, and electrical glory. Nor can moving be self-moving apart from the animate organism being located in a setting, a context, an environment; not simply an *ether* against which moving can occur or be measured, but an *other* that, in a moving-effecting relationship, gives rise to value, to direction, to coherence, and indeed to self and world. Self-moving requires self in the sense of separation from other, though not necessarily a fully conscious awareness of self, ego. As humans, we are often our core interest (what is this mystery that is us?), but in self-moving we are also kin to the amoeba, the fruit fly, the squirrel, the mantis shrimp, and the baboon; and we best not forget it. All members of this family are distinguished each species by its distinctive mode of motility and gestural and postural constituency linked to a characteristic morphology. Humans are modern creatures with upright posture and bipedal motility with large brains, opposing thumbs, and no tails; yet our long pre-history is traced through a morphological evolution interlocked with our own style and manner of self-moving. We are kin to eons of ancestors whose living experience contributed to who they, through us, have become. And the journey continues.

Moving inevitably has a *copresent implication*, to use Maurice Merleau-Ponty's term;² the entwining³ to the point of inseparability of things whose identity and existence demand independence, separateness; in other words, a multiplicity of oppositionals that is also a unity. To embrace the copresence of separation and identity—a twoness that is also a oneness—is at the core of our humanity as well as the distinction of self-movement. Moving requires some "there," a goal or a moving to, whose presence is also "here," a quality inseparable from the moving body. Moving then involves a "hereness" of an other or "thereness" that is at a distance to give direction and value and energy to our moving from "here" to "there." The moving itself can be located in no place—that's the very quality of

¹ Barbaras, "Life and Exteriority," 105.

² Cite and discuss M-P's use of the term "copresent implication."

³ Etymology and definition of *entwine* hold no surprises indicating its long use as to make or put in twine where twine is two or more strands of thread twisted together and is related to the word twin.

moving--neither here nor there, but as transition or change implicating a here and a there, essentially both distinct yet copresent. The gap, if virtual, yawns on as the space of life. Moving requires the copresence of "other" and "self," separate (wholly discrete) yet inseparable, interdependent, two yet one; a copresent implication that allows perception and knowledge, that is, the acts of perceiving and knowing.

There is not first an immobile body that then takes on action; action is a customization of moving already in motion. There is no mind that commands and directs movement out of stillness; mind is surely inconceivable apart from living movement. It is popular now to say that we are *embodied*, yet is this not a misdirection based on the failure to comprehend that living is already and only self-moving body? The prefix "em-" after all means to "put in or on; go on or into; surround or cover" implying that "we" are something besides a moving body, that we come disembodied (bodiless, debodied) and then are "put in" a body. Yet, we cannot *embody* if we are already and always have been a moving living body. And we are prone to considering bodies as *embedded*, as body placed or situated in an environment, yet is this also not a misdirection that fails to comprehend that living is already and only a self-moving body possible only in the context of an other?⁴ Moving, and thus living, occurs only in connection of body with what is beyond; it is always transcending as it is emanating, virtualizing as it is actualizing, incorporeal as it is corporeal. Much attention is given to brain or abstracted as mind, the epiphenomenal correlate of brain or the "brain plus." *Body/brain* tension or opposition or problem is a manufactured opposition that simply does not exist other than as our invention; it is the product of movement-stopping language⁵ and backfilled or retrograde measurance. The mind/body, brain/body problems exist only if these components are chopped out of the self-moving living organism; only as autopsy. The distinction among constituents that comprise animate organisms is best understood, if retained at all, as ingredients of a copresent implication, a twoness (or multipleness) that is inseparably entwined, as a dynamic of animate organism to be celebrated rather than a problem to be resolved.

The copresent implication is the engine of vitality. The self-moving animate organism is simply impossible without the constant neurobiological coordination of tissues of all types;

⁴ See Sheets-Johnstone, 310-11, 454, 466-67, 496-97 for her critique of "embody," "enaction," and similar terms. She is even more incisive in her "Emotion and Movement," 274-5 where she writes, "the term 'embodied' is a lexical band-aid covering a 350-year-old wound generated and kept suppurating by a schizoid metaphysics." (275). The term "enaction" is proposed as the "new paradigm" for cognitive science (see Thompson ? *Enaction*). It has a significant history of development that correlates closely with the development of cognitive science. Certainly while "action" correlates well with self-movement, the implications of the "enaction" form need be carefully reconsidered in terms of Sheets-Johnstone's comments. Sheets-Johnstone even includes warnings about such compound terms as "lived body" that were introduced by Merleau-Ponty (310). I fully agree with Sheets-Johnstone and recognize that finding alternatives to the use of such terminology is far more than just clever use of language, but demands a wholly new and innovative approach. This concern is related to my discussion of the Humpty Principle.

⁵ Sheets-Johnstone holds that self is unavoidably divided by language; that language is post kinetic. 435-38.

how can we ignore any of them? What is the basis for the arrogance that would proclaim but one subsystem, usually the brain and not even the nervous system, as all-important?⁶

Yet how do we know it, this self-movement, if we cannot measure it, if we cannot get it to stop long enough to become some thing? Remarkably moving is copresent with sensation. The copresent implication of moving and touching will be developed more fully in the account of touching and proprioception.⁷ This feeling of moving has long been noted and is obvious to any mover. In 1754 French philosopher Etienne Bonnot de Condillac implicated sensation in moving when he responded to the “flying man” thought challenge by indicating that self-touch would originate self-awareness. Later in the first decade of the nineteenth century another French philosopher, Pierre Main de Biran, acknowledged the copresent implication of sensation and self-moving by suggesting that one wouldn’t even have to physically touch oneself, just moving one’s hand would awaken self-awareness.⁸ Moving implicates sensation, touch. Sensation is, Brian Massumi writes, “a directly disjunctive self-coinciding. Sensation is never simple—always doubled by the feeling of having a feeling. Self-referential. A resonance, an interference pattern.”⁹ It is in this self-referentiality, its sense of sensing, that we discover the resounding reentrant¹⁰ process that is commonly described in terms of “tonus,” (Massumi’s term is “resonation”) broadly or organically conceived; the resounding dynamics that support awareness and coherence. Moving/sensation is a feeling kind of knowing, a feeling of the resonance of its copresence. It is the deepest kind of knowing; perhaps the foundation of all knowing. It is ironic that this resounding, this echo,¹¹ is so often marked as superfluous and dismissed as untrustworthy.¹²

Moving is always already there¹³ and needs no account of origination apart from that of quickening. This is why phenomenologists have been the ones most interested in moving. Yet, to understand self-moving is nothing short of attempting to comprehend vitality, that

⁶ I’m surprised by the penchant in current style to separate the brain as the focus for the explanation and understanding of many things human. A recent example is Lisa Feldman Barrett’s acclaimed book *How Emotions are Made: The Secret Life of the Brain* (2017). Barrett needs only a comment in a footnote to explain “When I use ‘body’ in this book, I am excluding the brain as in the sentence, ‘Your brain tells your body to move.’ To refer to the body including the brain, I write ‘the anatomical body.’” And throughout the book the brain segment of the central nervous system, that is, the brain in the skull, is presented as some separate entity with constant references to the body communicating its feelings to the brain without even acknowledging that it does so by means of the peripheral nervous system.

⁷ See below Chapter 3: Touching: Tactility and Proprioception

⁸ Sources for this ??? incl Heller-Roasin and others. I will deal with this famous example more fully later (where?).

⁹ Massumi, *Parables*, (pp. 13-14, check quotation).

¹⁰ Reentrant: pointing inward as in “reentrant angle,” anticipating Gerald Edelman’s discussion of neurological reentrant processes, key to later discussions.

¹¹ Massumi discusses this tonic in terms of echo *Parables*, p. 14.

¹² See Chapter 8 “Fat Present” for a much fuller development of tonus, resounding, echo.

¹³ Acknowledge significance of term to Husserl, etc.

is life itself.¹⁴ The effort of understanding movement is an endless process of reaching and grasping tied more to hands and feet than to some abstract concoction. Even a smeary sketch of what all is involved—the processes, the constituents, the implications of living movement—will contour the potential of our effort and energize its own moving. What endeavor could be more wondrous more profound more complex?

Why not, then, begin an account of vitality (and also perceiving and knowing) with self-moving? Isn't this a direct route to what is most interesting and important? Can't we bypass that tedious effort of attempting to solve the "mind/body problem" already made impossible by the post-kinetic articulation of it as a "problem" that assumes without question the separation and opposition implied by these terms? This solve-the-problem approach is plagued from the start by what I call, invoking the familiar and popular, the Humpty Principle, that is, that one cannot put something assumed at the outset to be broken asunder seamlessly back together without retaining some continuing presence of the separation of pieces. Can we not also sidestep the inevitable "problems" of pursuing the "body" as is currently vogue? Isn't the emphasis of this term often a thinly veiled euphemism for ignoring or offering an alternative to our penchant obsession with mind, brain, language? Can the results of these "body" approaches lead to anything other than a reversal of the very same values that have prevailed with the traditional focus on mind and language? Were it not so broadly accepted, can the popularity of attributing all understanding of everything human (and all organisms with brains) to brain functions and brain-map locations lead to anything but a laughable truncation of life and vitality to a motionless folded mass in the head (just as well be in a glass jar! Or a Dalek) even if colored in with bright electronic crayons by imaging technology? Do not body-focused studies always carry the omen of attending to the heretofore forgotten or ignored; are these studies not also marked by the stain of the forbidden? Brains are essential to self-movement yet not any more so than are the other organs and tissues and bones. And the foldings and clusterings of our brains are quite literally shaped by our moving bodies. We even map the brain in part by etching on it a homunculus, the image of an oddly shaped little body, deformed to correlate with those parts that are engaged in the most obvious movement. Do we really imagine that this odd little cartoon sketch pre-existed on its own and gave rise to the physical body? In brain-centered studies that find agency in the brain, where and what is the agent, the unified master of the unbelievably complex brain functions? Doesn't such an approach assume something like the brain itself needing to have a brain? Each of the subsystems—nervous, musculoskeletal, endocrine—must always, eventually, be understood in relation to the others in terms of the whole animate organism, that is, in terms of self-moving. The strategy of focusing on self-moving is not to determine the hierarchy among the systems, but to recognize them as participants in copresent implication, to fathom how multiplicity can coordinate itself despite unbelievable complexity and parallel functioning. The gain is not in separating or finally

¹⁴ Barbaras and Massumi have been particularly aware of the movement-life connection though it dates from Aristotle; certainly also Sheets-Johnstone. Were the works of Jan P??? , available largely through Barbaras's discussion, more available they would surely also contribute heavily.

uniting the twines in order to find “the one,”¹⁵ but rather in comprehending that the very condition wherein what is separate and independent is also interdependent and impossibly joined and that it is in this remarkable, seeming impossible, that locates the motor and fuel of vitality, aliveness.

Maxine Sheets-Johnstone describes that we enter life moving and that our life unfolds in movement.

In the beginning we are simply infused with movement—not merely with the propensity to move, but with the real thing. This primal animateness, this original kinetic spontaneity that infuses our being and defines our aliveness is our point of departure for living in the world and making sense of it. . . . We literally discover ourselves in movement. We grow kinetically into our bodies. In particular, we grow into those distinctive ways of moving that come with our being the bodies we are. In our spontaneity of movement, we discover arms that extend, spines that bend, knees that flex, mouths that shut, and so on. We make sense of ourselves in the course of moving.¹⁶

Sheets-Johnstone, following most directly in the lineage of Edmund Husserl, describes how through moving we come to be who we are as moving knowing bodies. The challenge is to take this statement radically, to take the importance of self-moving radically, because I believe that Sheets-Johnstone intends her statements on movement in a radical sense. Although she identifies animateness as defining our aliveness, I think we are historically gesturally naturalized to miss the fullness of her intent. Conditioned by a lifeway shaped by the progressive decline in moving as an expected and accepted aspect of our life course, we may be inclined to read her statement as limiting the primacy of movement to infancy and childhood, to originary discoveries. With our self-understanding shaped, since Descartes at least, to identify mind, vague though it is, as the “essence” of our distinctiveness while body is considered only as the supporting machinery, we are likely to relegate self-moving to mundane mechanics, to transportation.

Sheets-Johnstone refers to a development in stages from “I move” to “I can.” “In discovering ourselves in movement and in turn expanding our kinetic repertoire of ‘I can’s,’ we embark on a lifelong journey of sense-making.”¹⁷ We might be tempted to understand her position as describing a progression from “original kinetic spontaneity” to some different more conscious more systematic ways of gaining understanding and awareness both of the mechanics of one’s body and the awareness of the capacity to move one’s body. Adults, we might suppose, do not discover through spontaneous movement the extent of

¹⁵ This effort to find Neo, the one, god, the master, the source, the answer, the meaning is surely inseparable from both our religious and scientific history. I’ll consider this idea, usually incidentally and tangentially, throughout this book, yet I think it is more at the core of what has determined what we feel is simply the most natural way of understanding ourselves and our world. To tip my hand, which likely is already done, I find this strategy at the heart of severe self-limitation.

¹⁶ Sheets-Johnstone, *The Primacy of Movement* (1999, 2nd ed. 2011) 136 [1999 ed] find the pgs for 2nd ed.

¹⁷ Sheets-Johnstone, 136-7 [1999 ed]

their arms or that their mouths close; this is kid stuff. The acquisition of corporeal concepts, such as “in,” which Sheets-Johnstone argues is likely the first corporeal concept acquired,¹⁸ thus occurs early in life. There is a suggestion that the spontaneous movement of early childhood establishes a base for life’s journey. And many readers might assume that the balance of life is then lived and explored, not through movement in this primary sense, but through mental intellectual activities that are the seal (we have assumed) of maturity.¹⁹ Indeed, it is the hallmark of our contemporary western cultures to experience a progressive decline of movement activity from childhood through the balance of life.²⁰ This adultist assumption, although narrow-mindedness, has become so naturalized that we may find it remarkably difficult to avoid; note that the implications of the term, narrow-mindedness that we use to indicate its fault is consistent with our gestural conditioning.

Sheets-Johnstone is confounded that philosophy largely ignores movement. “Given the fact that we intuitively equate aliveness with movement, it is difficult to explain why philosophers would overlook the primacy of movement in their renditions of what it is to be human.”²¹ Yet she offers some “conceptual hazards” that contribute to “an undue elevation of language, a radical materialism, and a Meccanized neurology.”²² In this book I want very much to show that the processes Sheets-Johnstone describes in association with movement are ever-present, though changing, throughout life, and they are so because self-movement is living movement. Not that we remain infants, not that we do not develop throughout life, but that we always develop and change through processes in which self-movement is essential and central.

It may also appear that Sheets-Johnstone understands that movement is something we do especially in this early stage of life; she uses the language of being “infused” with movement. Even her term “I move” may appear to suggest (again, I do not believe that Sheets-Johnstone actually believes this) that from the beginning the “I” is separable from the movement the “I” does; that is, that the “I” is the director or initiator of movement. I suggest that these issues arise from the development of our language to reflect the gestural naturalization of a distinction of mind and body; evidence of the Humpty Problem. In our predisposition to uphold this separation we may interpret Sheets-Johnstone’s term “infused” as meaning something like “bathed in” or “drenched with” rather than “fusion.” The implication some may draw is that I move in order to discover the details of myself, to become “aware” and to acquire “agency” or a repertoire of “I can’s” that give distinction to the I that I become. In other words, we move as the first “I can” to acquire the fuller repertoire of “I can’s.” If we discover ourselves through movement, then movement is the means to discovering who we are rather than being inseparable from who we already are.

¹⁸ Sheets-Johnstone, “???” in *Enaction*, ed by ..., p. ???

¹⁹ Interestingly the System 1 and 2 distinctions made by Nobelist Daniel Kahneman in *Thinking Fast and Slow* (2011) correspond in interesting ways with this distinction. I will comment further in time on his approach, which I believe suffers from not being considered in the context of self-movement.

²⁰ This progressive decline is an easily supported broad generalization, yet it is clear that there are common exceptions, these being quite significant.

²¹ Sheets-Johnstone, p. 117.

²² Sheets-Johnstone, 347.

Here again, I want to insist that we understand movement, self-moving, as inseparable from who we are in the most ontological sense; we are moving beings, animate organisms. Even our physical human bodies (and those of our animate kin) are distinctively shaped by, constructed in the process of, self-moving.²³ Our material and organic composition reflects the way we move ourselves. We be moving.

It is my contention that the primacy of movement needs to be radicalized. "I am self-moving" or "I equal self-moving" is, I believe, preferable to "I move." In his discussion of a statement made by Czech philosopher Jan Patočka, Renaud Barbaras put it this way: "it is *in living movement that the essence of incarnation resides*."²⁴ Patočka makes the point clearly in his own statement. "The personal body is not a thing in objective space. It is a life that, by itself, is *spatially*, that *produces* its own localization, that makes itself spatial. The personal body is not a being in the way that a thing is, but as relationship, or rather that as relating to self that is the subjective relationship that is only by making the detour through an outside being. Moreover, for this very reason, it is necessarily living body, it does not need to localize itself among things as one of them."²⁵ The distinction is key in the location of movement related to the body.

Husserl's term "animate organism" must, I believe, be taken profoundly in that it is in the moving that the organism's *incarnation resides*, to use Barbaras's term. Husserl made it clear as well when he wrote, "Animation designates the way in which mind acquires a locality in the spatial world, its spatialization, as it were, and together with its corporal support, acquires reality."²⁶ The organism, a physical body located in space, does not discover itself by moving, as it is suggested by at least one possible reading of the Sheets-Johnstone quotation. We live as moving.

²³ From the perspective of evolution whereas it was once believed that bipedalism arose as the result of the increased size of the brain; it appears now that the evidence is pointing in the other sequence, that the brain increased as a result of bipedal motility. [citation] I would rather imagine that these brain/body are in such intimate service to motility that they had to have evolved together. J. A. Scott Kelso argued it this way. "It is important to keep in mind . . . that the brain did not evolve merely to register representations of the world; rather, it evolved for adaptive action and behavior. Musculoskeletal structures coevolved with appropriate brain structures so that the entire unit functions together." (1995, 268) And he based supported his view by reference to Gerald Edelman who also viewed the entire system with all the constituent parts evolving together. Maxine Sheets-Johnstone also holds this view. (Sheets-Johnstone, "Emotion and Movement" 261). While, of course, since accounts of evolution are all backfilled, all from autopsy, the brain and the feet and hands can be considered independently and it can be argued that the independent development of one gave rise to the development of the other. From the perspective of self-movement, from the perspective of the animate organism, this just can't make much sense to me. I don't see how it is possible for bipedalism to occur without accompanying expansion of brain functions.

²⁴ Barbaras, *Disire and Distance*, 143 (ital. in orig).

²⁵ Patočka ??? quoted in Barbaras, *Desire and Distance*, p. 143 (ital. in orig).

²⁶ Husserl (1977: 101) quoted in S-J p. 113.

Yet this incarnation of moving is not a reduction to materialism or to mere biology as we might expect. Brian Massumi articulates this radical position when he writes, “to think the body in movement thus means accepting the paradox that there is an incorporeal dimension *of the body*. Of it, but not it. Real, material, but incorporeal. Inseparable, coincident, but disjunct.”²⁷ Massumi is referring to the transitional aspect of movement; that it is never in any place, “never present in position, only ever in passing. There is an abstractness pertaining to the transitional immediacy of a real relation—that of a body to its own indeterminacy (its openness is an elsewhere and otherwise than it is, in any here and now.)”²⁸ Movement when moving isn’t measurable because it is always incomplete, having left but not yet arrived, neither here nor there, yet dependent on both; indeterminate abstract incorporeal, yet, of course, material body as well. Rather than to invoke the term “paradox,” I prefer Merleau-Ponty’s term *copresent implication* because I think, like movement, this term emphasizes that it is the very conditions which are paradoxical in structural characteristics that are vitalizing and ontogenetic. It is not for us to be confounded by paradox so much as it is for us to marvel at the ontogenetic force that is the implication of copresence. Erin Manning puts it this way, “movement is qualitative multiplicity . . . becoming toward a potential future that will always remain not-yet.”²⁹

There are many ways of glimpsing moving. In rather poetic terms, if losing some precision to vague and romantic images, Erin Manning invokes partnering, as in dancing, where there are two desiring bodies moving/touching, the movement always being in the two bodies seeking in their entwining to be one. She writes, “There are always at least two bodies. These two stand close, facing one another, reaching-toward an embrace that will signal an acceleration of the movement that has always already begun. The movement within becomes a movement without, not internal-external, but folding and bridging in an intensity of preacceleration. . . . Preacceleration: a movement of the not-yet that composes the more-than-one that is my body. Call it incipient action.”³⁰ I have considered this attribute of moving in terms of a “gap—an opening or distance without dimension—and pursued it inspired by Maurice Merleau-Ponty’s notion of “pure depth,”³¹ distance between here and there before there is any concrete space that can be measured; self-moving is a felt thickness.

Renaud Barbaras plumbs other depths of this grasping. He connects movement with life itself; an essential radicalization of moving. “Living movement” is how Barbaras sometimes terms it.

Movement does not take root in life itself, but in what puts life in danger. The living being is in movement, not insofar as it is living, but rather insofar as it is likely to cease living. Movement is the reply to an external threat, and so long as it is such, it is external to the essence of life. Consequently, if movement does not express life as much as the situation of precariousness in which life finds itself, we are led to

²⁷ Massumi, *Parables*, p. 5.

²⁸ Massumi, *Parables*, p. 5.

²⁹ Manning, *Relationscape*, 17 (ck quote)

³⁰ Manning, *Relationscape*, 15. also cite her “Always More than One.”

³¹ Gill, DCR, section on pure depth, also see below Ch 8 (??).

wonder how movement is possible. How can a being that strives for self-preservation, which is repetition, be a mobile being? In truth, only a being that is originally capable of moving itself, that is essentially movement, is able to act to satisfy its needs; only a being that is originally in touch with exteriority is able to discover what is likely to suit it there.³²

I think we can feel this danger (isn't it always there? isn't that a felt condition of life? Of the looming of "death"?), this sense of the living being in movement "insofar as it is likely to cease living;" the sense that moving is life always on the cusp of its own demise. I have often felt this in dancing,³³ which is, as I have written, a way of articulating by means of movement the distinctive attributes of self-movement. In dancing, there is that moment of initiating the movement that we understand as dancing. One "falls into dancing," that is, somehow discovers oneself dancing. From that moment, the dancing continues until it stops, yet throughout there is always that edge of danger, a sense of present threat. I believe one of the most powerful aspects of dancing is that it bears in the presence of its movement the danger—experienced as excitement or terror, but always as enthrallment—that this dancing is precarious; it can stop at any moment. The character of its very presence—its energy and feeling and engagement—is shaped by the present threat of its imminent failure to continue. Precisely because dancing is moving, as life, it can simply cease to be; self-moving proclaims "is," yes the energy of this "is" is in the constant presence of "is not." Dancing allows us to experience—in a slightly objectified way by taking us into that dimensionless gap because it is, in some sense, moving about moving—the ontogenetics of self-moving; that experience can have the quality of imminent danger or the "interior negativity in the world"³⁴ or the wonderment implied by copresence.

Complementing Sheets-Johnstone's notion that conception is corporeal, that concepts are born of self-movement, is Barbaras's recognition that "only a being that is originally in touch with exteriority is able to discover what is likely to suit it there," that is, self-moving always and necessarily requires being in touch with the moving environment. Yet there is something of the miraculous in the self-transcendent implications of exteriority, of outside.³⁵

Whereas dancing is a kind of self-movement about self-movement, living movement is inseparable from the force of life itself, from vitality. Barbaras gets to the radical core of self-movement. Movement does not arise to meet the threat to life because only a being that is essentially movement is capable of self-movement. Yet, Barbaras charts another aspect of self-movement that is fundamental; an aspect of movement is necessarily being in touch with exteriority. This iterates what Massumi was referring to as the incorporeality of

³² Barbaras, "Life, Movement, Desire," 11.

³³ Good examples also are sport—think of the skier starting down the mountain with continuation of self-moving constantly being threatened—and music—once the music begins there is the constant anticipation of the next notes or phrases that are not yet and may not be.

³⁴ Barbaras, D&D, 86.

³⁵ For an extensive discussion of "outside" see my "Into the Future" essay "Orphas of the Sky ..."

movement. Movement is never in any place, it is always in transition; transition is transcendence in being exterior to the moving self, even to the physical self.

Key to the radical position of movement is that “I am self-movement,” yet, Barbaras’s point is that self-movement cannot simply arise in the singularity of the self, confined to the one moving. Life only ever exists “in touch with” an environment that “puts life in danger” simply by its otherness and that life is already a capability of self-moving in relation to and response to other. This observation was made much earlier by John Dewey whose discussion of external danger giving rise to “need” anticipates Barbaras’s discussion of “desire.” In his book *Art as Experience* (1934) Dewey wrote, “At every moment, the living creature is exposed to dangers from its surroundings, and at every moment, it must draw upon something in its surroundings to satisfy its needs. The career and destiny of a living thing are bound up with its interchange with environment, not externally but in the most intimate needs These biological commonplaces . . . reach to the roots of the esthetic in experience.”³⁶

Manning’s tango dancers put this aspect of moving in romantic terms (although here a negative that accompanies desire is always present), whereas Barbaras puts it in terms of danger and interior negativity. Moving is not something that arises in the living being in order to meet an external life threatening need. Barbaras argues that moving cannot arise from anything other than moving, thus moving is not rooted in life itself. Rather, it would seem that life is rooted in self-moving in the context of a potentially threatening and enabling other. Self-moving is then inseparable from perception. This is the core argument of Barbaras’s book *Desire and Distance: Introduction to a Phenomenology of Perception* (1999, English ed. 2006). And if moving is perceiving, then it is also knowing.³⁷

Likely we have all spent a few idle minutes at one time or another reflecting on Zeno’s well-known arrow paradox. Initially we are likely fascinated by the seeming paradox, yet after trying to resolve the issue we perhaps eventually drop it saying “to hell with it.” The arrow is shot toward a target. The target is at a finite distance; as such this distance can be divided an infinite number of times. No matter how small the increment of the half distance remaining, after each iteration of dividing, the remaining distance can be divided yet again; thus, it still takes time for the arrow to cross the remaining half. The arrow logically will never reach the target. Or put strongly, the arrow can never move at all.

Taking up Zeno’s problem, Brian Massumi credits Henri Bergson with offering the first satisfying discussion of the ancient paradox and in so doing leading us to another way of imagining movement as moving. Bergson held that a path is not composed of positions, but rather that it is non-decomposable. Movement is a dynamic. The continuity of movement is an order of reality other than the measurable divisible space it can be confirmed as having crossed. Bergson wrote,

We attribute to motion the divisibility of space which it traversed, forgetting that it is quite possible to divide an object, but not an act: and on the other hand we

³⁶ Dewey (1934, 535) quoted in Johnson, Meaning, 153-4. Is this Art as Experience? Ck it out to be sure.

³⁷ See also below my chapter 6 “Perceiving and Knowing.”

accustom ourselves to projecting this act itself into space, to apply it to the whole of the line which the moving body traverses, in a word to solidify.³⁸

We are confounded by Zeno when we fail to distinguish between the action of the arrow in moving flight, which is non-divisible so long as it is the moving (remember movement as moving is never in any point or place; if it were in place it wouldn't be moving), with the post-movement analysis of the movement territorialized, that is, plotted in space and time. These are two different orders of reality. They both require self-movement, if in different aspects of the process.

The imagery allows us some additional potential to our repetitive groping. Space, seen as a grid or as something fixed is, in Bergson's perspective, itself a *retrograde* construct, to use the terms of Bergson anticipating my later discussion.³⁹ Measurable space is, as Massumi puts it, "a stopping the world in thought, thinking away the dynamic unity, the continuity of its movement." His introduction to *Parables of the Virtual* is titled "concrete is as concrete doesn't" playing cleverly on the distinction between cement and concrete.⁴⁰ Or put differently he writes, "a thing is when it isn't doing." This reminds me of Navajo language which is constructed almost totally of verbs acknowledging that motion and life is essential to everything all the time. Reference to non-moving things is a complex construction for Navajos since they have to say something like, "that which usually is doing this or that but is not now doing it." The verb-heavy composition of Navajo language makes it difficult to take the movement, the vitality, out of the world of experience to get simply material thing-based reality. No wonder that for Navajos the border between the biological and the prosthetic (or what we'd call the material) is not really clear or perhaps even viable. No wonder Navajos find life force and movement in what we typically understand as the physical objects of the world.⁴¹

In proposing a radical approach of beginning any consideration of animate organisms with the recognition of the copresence that is inherent to self-movement, I have promoted the foregrounding of process and possibility rather than documenting positions and things. Dynamics of relationships rather than reflecting on and resolving problems. Ontogenicity rather ontology. Self-moving rather than *embodied*, *embedded*, *enacted* movement. Animate organism rather than mind-body or brain-body or spirit-body. As I have attempted to practice my own preaching; the difficulty of maintaining these priorities and to do so in sufficiently radical sense is considerable because of the ever-present insidiousness of the familiar opposing positions. Our history and culture have so gesturally naturalized us to these practices, these perspectives, that they seem to us to be utterly obvious; they are born in the structure and metaphors of our language; they have shaped how we actually perceive the world. There is an almost irresistible tendency to objectify, to

³⁸ quoted in Manning, p. 18, check quotation. See also Massumi, *Parables*, p. 6.

³⁹ See Chapter 8 "Fat Present"

⁴⁰ In case this isn't immediately familiar, cement is **concrete** is the stone-like structure formed after **cement** and other materials are mixed together.

⁴¹ Once we grasp something of the importance of moving, it seems somewhat embarrassing that we've insisted on projecting onto Navajos and people of other cultures primitivist notions like "animism."

separate, to oppose, to isolate, to divide, to code, to grid, to stop time and freeze space that we might resolve, define, describe, conclude, master, and find meaning.⁴² Interestingly, these perspectives and practices have become so naturalized that, even when we are aware that they are equivalent to “dissection” and that “to dissect is to kill,” we nonetheless typically continue with a quick warning that what we are doing (killing) is for purposes of understanding living. By starting this work with a discussion of moving, self-moving, I believe that we simply have to do more than acknowledge the “killing” nature of our work and proceed on in the name of life. We must develop perspectives that enable us to do *kinesiology* rather than *autopsy*.

In writing of my 2012 book *Dancing Culture Religion*, inspired by Massumi, I made every effort to keep the dancing in the dance, to show that the dance is only when the dancing isn't. In that study of dancing I used the “-ing” gerund-making suffix to constantly remind my readers and myself that I'm first concerned with the actions, the self-moving aspect, of dancing. I believe that we have often limited our study of human movings to objectified non-moving forms, things that have moved, largely because we have yet to figure out how to study and think about the moving in process, the ongoingness of moving, the not-being-in-any-place aspect of moving itself. Our attempts to “grasp” and to “describe” tend to squeeze the action out of the process by the very retrograde nature of this perspective. In my study of dancing I wanted to try to move beyond that limitation to demonstrate that, when we do so, we are not simply rendered dumb and mute in the process. There is much we can do to keep the moving to the fore of our interest. My efforts included not only a consideration of moving, but also the invocation of well-known dynamics such as gesture and play and seduction and a conjunctive term I call “self-othering.” I presented these in terms of what I call, following Jacques Derrida, “structuralities,” rather than grids or principles (structures), in the effort to keep the dynamics and processes and unpredictabilities and opennesses foremost in my efforts. Opening up the moving to our appreciation and awareness is a great challenge, inseparable from vitality itself.

Even as I was writing *Dancing Culture Religion*, I was aware of a nagging issue that I believe is part of that insidiousness of our history, one that postmodern concerns have persistently attempted to address.⁴³ As I attempted to oppose objectification, backfilling, gridifying, losing the dancing in the dances, I sensed then and can proclaim now that this is itself a subtle form of losing the fullness of the dynamics of self-movement, of dancing, of moving and it therefore amounts to a truncation in some respects of the full dynamic landscape of the animate organism and, in this case, particularly the human version of the animate organism. In my writing and reflection on dancing I had some feelings that what I was proposing was that nothing short of dancing, dancing itself, was adequate and defensible; a noble and romantic cause perhaps. All those objectifying studies of dance were somehow surely second class at best. Yet, of course, the very vitality of my own academic energies,

⁴² Brian Massumi effectively describes this process and its implications in Ch 1 of his *Parables*.

⁴³ I think particularly of Derrida's discussion of play in which he refuses to allow play to be adequately described but always kept in play with other possibilities, possibilities that cannot be but vaguely imagined ... see ???

while deeply shaped I believe by my own self-moving, by my own dancing, was engendered sitting with my self-movement largely limited to micro-gestures of my fingers. Self-enigma.

In light of these self-reflections, this self-critique, I want to be clear that I have no thought of abandoning the primacy and persistence of self-moving to the entirety of life for animate organisms. I completely reject that movement is important mostly to kids to be mostly replaced by intellect and reason in adults. I strongly retain a sense that there is something very wrong, in the fullest sense of being life-opposing, about cultural and historical expectations for the progressive decline of movement correlating with maturity and aging. Yet, what I want to do is to try to show that reflection, objectification, mapping, reasoning, writing, intellection, knowing are all not in opposition to, but rather in continuity with, indeed, inseparable from, self-moving. These aspirations are all based on and practice implications of the primacies of self-moving; it is essential that we see them as such. The shift beyond the position I was doggedly pursuing in *Dancing Culture Religion* is perhaps not so radical really. It is to see continuities rather than excluding oppositions, processes even where the effort is to stop them, dynamics even in objects nailed by language into seeming stability. It is to be inclusive rather than exclusive, thus taking radically the primacy of self-movement.

To recognize the continuities however includes recognizing the impact of movement on the approaches and perspectives commonly used to hopefully open and challenge us to discover and develop more dynamic alternatives. Henri Bergson offered some provocative insights by using movement terminology to describe common means of analysis. He referred to analysis as “retrograde movement” and described it as a “halt.”⁴⁴ Erin Manning and Brian Massumi have both developed the language of “territorialization” in terms of movement. As Manning notes “territorialization is always to stop movement, to begin the analysis from a stopping and then to make a body move.”⁴⁵ What is essential to demonstrate is that if, as I believe, self-movement has primacy, then it is somehow vitally present, rather than simply absent, even in “territorializations” and “halts.” And recognizing and developing this moving presence will, I believe, allow us to see limitations in the received approaches and assumptions that we might creatively develop who we are and what we do as academics, as adults, as thinkers. Sheets-Johnstone addressed the issue of our received “factual views of movement.” She wrote, “*As beheld in the natural attitude*, movement is the factual displacement of an object from point A to point B, thus a change in position. Our first task is to confront this view of movement and show how it not only conceals the essential character of movement but impedes a clear conception of *movement* from the start by centering attention not on movement but on *an object in motion*.”⁴⁶

“Place” is perhaps the most powerful image reflecting the issues of the academic study of religion over the last fifty years and perhaps the academy generally; where does the scholar “stand” that religions might be insightfully studied? And, knowing the character of

⁴⁴ Henri Bergson, ???, “Retrograde Movement ...”, pp. ???, I’ll discuss Bergson much more in chapter on Fat Present (I think)

⁴⁵ Manning, *Relationscape*, 23.

⁴⁶ Sheets-Johnstone, 202 (ital. in original).

the place on which one stands is to know and be able to articulate that person's religion.⁴⁷ I have written much about this perspective as two of the most influential religion scholars of the last half-century, Mircea Eliade and Jonathan Smith, have presented it.⁴⁸ In terms of self-movement we must recognize that the concern with "place" and "stance" (even "perspective" since it depends on "place") depends on retrograde movements, halts, territorializations. These are themselves forms of self-movement, yet they are aimed at stopping movement, at removing the movement, at allowing movement only as an after effect. Recognizing the complexity of the issue, scholars like Jonathan Smith have suggested that our choice of "stance," that is, theory, is our most fundamental choice. What is fascinating to me about this observation is that "choice" indicates a copresence, a twoness or multipleness of possibilities that are copresent. Choice is process and action and oscillatory movement; this or that option held together yet distinct. Place, standing, perspective is post-choice and amounts to a halt. This observation suggests that the most vitalized part of the study of religion or any subject that sees the critical selection of place, the choice of theory, happens before one even begins in the vital movement-rich process of choosing, choosing where to begin, where to stand. Smith has often written that the choice of stance is the most important aspect of the study. Yet, it is clear for most that even this choice is rarely explained or the moving and often agonizing process of choosing rarely presented. One's discipline or training or mentor or field often determines such choices. For many the place on which one stands is who one is and that we function to defend and to perpetuate the advantages of its fixity.⁴⁹ Why do we not appreciate the copresent implication that is ongoing even as one gravitates toward a "place to stand" that allows this vitality to also characterize the connection made with the subject itself?

To review: As animate organisms, moving is who and what we are; our distinction is that we self-move, we are self-movement. We do not acquire movement; we do not learn how to move; we come to life as we self-move. Self-moving is always a moving in context, in response to and in the presence of something not self, for example, environment or other. Moving is never in any place; moving is transition, change. Moving requires a copresence of a here and a there, separate (at a distance even if a virtual one) but already joined (copresent) in the energetics of moving. The "there" must be also "here" that we self-move, that we live. Moving, in requiring distance without dimension and desire without fulfillment, is then a copresence, an entwining of fundamental distinctions in space and time. It is in comprehending and embracing the implications of this copresence that we begin to understand (perhaps sense or glimpse) vitality; coincidentally the copresence that is moving becomes the radical base, serving as blueprint and inspiration, for our approach to inquiry and appreciation.

As humans, we are kin to all other animate organisms, all self-movers. Yet it is in terms of style and manner of self-movement (modes of motility) that we distinguish species of

⁴⁷ Jonathan Smith notes that this is the principal insight offered by the whole body of Mircea Eliade's work. Source????

⁴⁸ Cite where I've written about it. And mention some titles "To Take Place" "No place to stand" etc. and also "Dancing" chapter in DCR.

⁴⁹ Thomas Kuhn in "???" referred to this as "normal science" by which he meant the perpetuation, without challenge, of the theories presented in textbooks.

animate organisms; each species has a distinctive mode and style of motility inseparable from distinctive postural and gestural mechanics. Through the evolution of modes and styles of motility, posture, and gesture we can chart our development even through the long trek of evolution. The evolution of upright bipedal motility is coincident with the emergence of modern humans. The growth of the brain correlates with the shaping of the feet and hands comprised of flexible fingers with an opposing thumb.⁵⁰

Our long fascination with automata, robots, androids, cyborgs, and monsters comprises a rich stream of stories and exempla by which to contemplate self-movement as an essential presence to life.⁵¹

Beginning with this radical understanding of self-moving—need I *remind*?—there is no mind/body problem to be solved; it is not practical or even sensible to focus exclusively on either body or mind, brains or muscle and bones. To say we are “embodied,” that we are “embedded” in the environment, or that we “enact” our lives is to miss the radical simplicity that we are already and always have been self-moving organisms. We literally cannot be without self-moving. The vitality that is life is identical with self-moving. Body is when body doesn’t (move); stillborn or corpse or object of study/analysis. We do not learn to move although we constantly learn to move differently and skillfully and our self-moving is at the core of our perceiving and knowing, our plasticity, and our accumulation of experience. To account for process and interacting self-adjusting networks is closer to self-moving than it is to propose objective description and linear explanation. Distinction and measure of time and space emerge from self-moving rather than the other way around. Loops and cycles, gaps and synapses, are more common, more essential, than fixed closed connections. Interdependence characterizes self-movement more than hierarchical dependence and positions of absolute control. As essential aspects and implications of self-moving, perception and knowing are ways of understanding the vital processes of ongoing life.

Certainly, it is my expectation that this radical understanding of self-moving is not limited to or even perhaps most appropriate for any discourse prone to “halts,” movement-stopping acts of rational discourse. It is my hope that since I find self-moving synonymous with living movement, as does Renaud Barbaras, this conversation will have impact on the way we look at life, lifestyle, and especially our anxieties about trying to resolve problems and fix incongruities.

The demands of this radical approach based on self-moving then are considerable. We must keep the animateness, the self-moving, distinction at the core. We must consider how all of the many systems that comprise us as animate organisms, in their enormous complexity, are understood in terms of self-moving. We must attempt to keep even our efforts at analysis and objectification and comprehension energized by the dynamics of self-moving. What principles or models or ideas might we look to as guides? Certainly our experiences of self-moving might be recommended, yet at the outset we may find this sufficiently unfamiliar as to be daunting.

⁵⁰ Feet and hands are a remarkably interesting and important topic that I will consider in depth in another book on gesture.

⁵¹ See my forthcoming book on this topic.

For me, the most provocative and helpful philosophical sources to guide us on this venture are the perspectives of pragmatism in the lineage of Charles Sanders Peirce, William James, and John Dewey and the more recent studies of perception by Maurice Merleau-Ponty along with the studies of the philosophy of movement by Renaud Barbaras, Maxine Sheets-Johnstone, and Brian Massumi. Yet, for me, the deep roots of this lineage stretch to Friedrich Schiller's *On the Aesthetic Education of Man* (1794). The continuity of connection to Schiller is real in that Peirce indicated that as a teenager he spent a summer reading Schiller and I believe Peirce's propensity to see triads must surely be rooted in this early exposure to Schiller.

Schiller is an inspiring source for helping us understand the play of copresence and to identify that it is connected with beauty. In the twenty-seven letters that comprise this book, he followed the pattern of juxtaposing oppositions in such a way as to show that it is in the interaction that occurs because of this juxtaposition that something new arises, some "third thing." Neither is comprehensible without the other. The two are not aspects of one another (parts of a whole in this respect); they are completely distinct from one another. Yet they engage one another in a relationship essential to both. Schiller describes the engagement, the interaction as the "third thing," and I'd suggest we see it as a copresence. That third thing, or drive, for Schiller is termed "play" which when fully realized is how we understand beauty.⁵² Play arises, he writes, as

a reciprocal action between the two drives, reciprocal action of such a kind that the activity of the one both gives rise to, and sets limits to, the activity of the other, and in which each in itself achieves its highest manifestation precisely by reason of the other being active. (XIV.1)⁵³

Beginning with Schiller then we must appreciate that opposing and wholly separate forces (or systems or imaginings) are not dual pairings that present a problem to be resolved. They constitute a copresence, a vital entwining, giving rise to play, to vitality, and, indeed as is evident from Schiller's title, also to beauty.⁵⁴

Charles S. Peirce held a similar perspective in his lifelong reflection on hypothetic inference (how hypotheses originate) that he often termed "abduction." In contrast to and complementing the pairing of deduction and induction, Peirce sought to describe a third process that defies a logical explanation in that it emerges as a function of the organic interplay of life lived in surprising contexts and situations. Late in Peirce's life his

⁵² I develop this discussion of Schiller in Ch 8 "Fat Present" in terms of this interrelationship being understood as "concert" or in terms I develop later resounding vessel.

⁵³ Friedrich Schiller, *On the Aesthetic Education of Man* (1794). Reference is customarily made in terms of the Roman numeral designation of the letter.

⁵⁴ See also DCR Chapter "Playing" and Native American Religious Action, Chapter 8, for my further discussions of Schiller.

discussion of abduction landed on play as a way of articulating abduction, hypothetic inference, creativity.⁵⁵

The lineage resumes with John Dewey's principle of continuity that relates immediately to the issue on the continuity between cognitive and organic functions. He wrote, "on the one side, there is no breach of continuity between operations of inquiry and biological operations and physical operations. 'Continuity,' on the other side, means that rational operations *grow out of* organic activities, without being identical with that from which they emerge."⁵⁶ This notion of continuity is later developed more fully with Maxine Sheets-Johnstone's "corporeal concepts" and George Lakoff's "image schemas."⁵⁷ As Mark Johnson notes, in terms of "Dewey's principle of continuity, what we call 'body' and 'mind' are simply convenient abstractions—shorthand ways of identifying aspects of an ongoing organism-environment interaction—and so cognition, thought, and symbolic interaction (such as language) must be understood as arising from organic processes."⁵⁸ Precisely the point I am attempting to establish by focusing on self-movement.

Pragmatism and its successors assume the integrity of the animate organism as well as the inseparability of the organism from its environment while addressing the issues of the distinctions that are so commonly made in radical ways implying discontinuity and independence. It is most important to acknowledge and be inspired by the long history of recognition of what I'm here referring to as, using Maurice Merleau-Ponty's term, *copresence* with attempts to articulate it with ideas like play and organism and pragmatism and continuity. There is, in some measure, even in the proposed principle of continuity the notion that the effort is in some sense to attempt to put Humpty back together again. The development that I hope might be made is to begin before Humpty falls off his wall, that is, to begin with the whole animate organism. I'm proposing that our best chance of working with the whole egg is by taking the primacy of self-movement in the most radical sense and appreciating the many constitutive twines and how they contribute, in conjunction with, in dynamic inseparability from, all the others. Self-movement is the twining, not the product of it.

Even as I look to this history that implicates the importance of movement, self-moving often either isn't mentioned at all or it is constantly present yet only as an unacknowledged background assumption. Almost invariably, even when it is recognized as a totally flawed and impossible approach, the common strategy for dealing with oppositions, contrasts, complements, paradoxes, tensions, is invariable to somehow reconcile and explain them; explain them away. Certainly, one of the broadest and most interesting of these efforts is J. A. Scott Kelso and David A. Engström's *The Complementary Nature* (2006). In their Preface

⁵⁵ C. S. Peirce, "A Neglected Argument for the Reality of God." ??? and see also my discussion of Peirce in ... essay "Play and Discovery" in *Religion: Always Already the Moving Body* (forthcoming). I develop a discussion of Peirce more fully below in Chapter ?? "Coherence"

⁵⁶ Dewey (1938/1991), *Logic: The Theory of Inquiry*, Vol. 12 of *The Later Works, 1925-1953*, edited by Jo Ann Boydston, p. 26, quoted in Mark Johnson, *The Meaning of the Body*, 107-8.

⁵⁷ See below Chapter 6 "Perceiving and Knowing"

⁵⁸ Mark Johnson, *The Meaning of the Body*, 117. Johnson's book itself offers a guide to what we are attempting here.

they articulate what I have come increasingly to call the Humpty Principle.⁵⁹ They write that

some new and different approaches to reconciling diametrically opposed positions are sorely needed. This is obviously easier said than done. It is actually quite tricky, because if one attempts to repudiate either/or thinking by trying to completely invalidate it, the either/or mind-set paradoxically remains. That is, if one says, 'either we use either/or thinking, or replace it with some other new, improved thinking,' one hasn't escaped either/or thinking at all! . . . [the approach of their book presents a] method of reconciliation includes disparate points of view rather than invalidating them, *especially* ones standing in obvious polar opposition."⁶⁰

I'll discuss aspects of their work more fully later,⁶¹ especially Kelso's work on coordination dynamics, yet I think it clear from this brief passage that they begin with the assumption that there is a "problem" and proceed to solve it by "reconciliation." They focus extensively on what they term as "in-betweenness." Even the organization of their book reflects, as they note, their strategy. They begin with a section on philosophy, followed by a section on science, followed by a section on their reconciliation that occurs somewhere in the in-between. From my perspective, even when they recognize quite clearly the challenge, their approach still leaves egg on Humpty's face. They begin with the broken Humpty, seemingly (and understandably) apparently not being able to imagine another beginning, and try to put him back together again by means of reconciliation and coordination.

Embracing the animate organism at the outset affirms that moving is life and that the organism comprised of all its coordinating and interdependent subsystems is about life, that is, about self-moving. There is no need for Dewey's principle of continuity because

⁵⁹ I first used this analogy in DCR pp???. While there it was offered as a clever jab, I have found myself frequently using it to refer to the impossible situation that our naturalized attitude toward opposition puts us in. The more I think of this nursery rhyme the more profound I understand it to be. It begins with the whole Humpty, but then traces a fall; well there are loads of implications to that. Then once there is the broken Humpty, nothing, not even all the king's horses and men, can put him back together again. To take my evolving approach would indicate that the story includes both the whole Humpty and the broken Humpty. To prefer the whole egg (to shift to the less personified view) leaves the egg nonproductive as either nourishment or as to its progenitive function. To prefer the broken egg is to lose the larger picture of wholeness and even the aesthetics. It isn't to reconcile the two. It isn't to find an in between where the egg is neither whole nor broken or both whole and broken. It is, I believe, to see the egg as copresent implication; two things that are opposites (whole and broken; clearly these can't be both or copresent) but that are, in some sense copresent, entwined at least in the sense that you can't have an egg without both; you have no drama in the nursery rhyme without being able to hold both present at once. It is the very impossibility of reconciliation (the cracks remaining and the egg on the face) that fuels the drama. And copresent implication does not take place in a medial space; but in revealing a different order of reality.

⁶⁰ Kelso and Engstrom, *The Complementary Nature*, xiii-xiv.

⁶¹ See also ??? [where do I discuss Kelso and E? isn't it "coherence?"]

there is no basis for separation and independence of brain and body. Moving does not occur only as a muscular function or as a matter confined to a mechanical body. Moving is simply impossible apart from organism and, as I have pushed to establish as the most fundamental of positions in this book, the organism arises and has its design indistinguishable from its moving, its self-moving. And self-moving, even if focused on a part, is always of the whole organism and also always in relation to something beyond or other than the moving self.

Rather than to argue a principle of continuity, I want to proceed on the basis of an account of the animate organism that at least attempts to honor and celebrate organicity, the dynamics and implications of the relationships of copresence among the remarkably complex composite of tissues and systems and functions. The brain and muscles can be dissected and described in detail wholly separate from one another. Yet, the brain and muscles entwine in moving; self-moving cannot occur other than as their entwining. Rather than contrive some way of finding continuity between them—and note that when we do so there is invariably a hierarchy and we know how these subsystems are traditionally relatively valued⁶²—we would be pressed to comprehend that either could exist apart from the other, the multiplicity that is unity.

Given the potential of approaching human studies beginning with the premise of the primacy of self-movement, I find it necessary to understand self-movement as broadly as practical. I don't think it is enough to make the case solely on the basis of a philosophical and anecdotal argument. If indeed self-moving is the core of animate organisms, then every aspect of the organism must contribute in some ways to self-moving and the implications of self-moving such as how it is central to perception, knowing, experiencing, feeling and emotion, living. Further, every aspect of the organism is shaped by its self-moving history and functionality. It fascinates me that self-moving is much appreciated in the terms of copresence, which implies the embracing of the rationally impossible identity of what are distinct from one another (sometimes often termed paradox) as the very essence⁶³ of living movement, of animate organisms. Terms like "copresence" are often relegated, and perhaps too often in a dismissive way, to philosophy or the human sciences or the humanities. Likely to focus on the seeming impossible dynamics of relationship is the sort of concern opposed by the natural sciences where the condition of "problem" requiring reasoned, fact-supported, quantifiable resolution or description. We are all overly familiar with the hard versus soft distinctions in the academy, with the seeming opposition of science and philosophy/humanities/art. And it is rare that anyone dare to breach the high wall separating these unfriendly territories. Yet there approaches are themselves parts of an organization often referred to by its wholeness and inclusiveness—university.

Anything that relates to animation and any issues that provide insight into even how organism, how animation, is possible, is of interest to me. I'm fascinated by the role of the

⁶² I must confess my considerable irritation at the present vogue for brain scientists and cognitive scientists to boldly proclaim what the brain exclusively causes us to do. See Churchland for example and the CSR folks.

⁶³ I use the term essence here only as a way of stating the obvious implications of the term "animate organism."

nervous system in self-movement despite not being a neuroscientist or a biologist. My growing comprehension of proprioception (kinesthetics) and its remarkable roles in self-moving (a role that is so central, but ignored by all but the rarest) has been powerfully influential as have so many other aspects of biology. It is not that we must attempt, as I think is a common objective, to reduce movement to some biological core component, yet I understand that every perspective is reductive and necessarily so; that is why each is a perspective on something larger, more whole. My interest is more in appreciating what is beyond adequate explanation than in reducing complexity to simplicity and I recognize that the depth of appreciation correlates with the increase in realization of the complexity and profundity of the animate organism. It is my interest to find a guide to my descriptive and reflective explorations of biological realms, realms that are typically considered off limits to the likes of me (and most science non-specialists), that will help me appreciate the beauty rather than get lost in the incomprehensible detail. To this end I find myself inspired and guided by ancient principles of architecture.

The Roman Vitruvius wrote the earliest surviving book on architecture *De architectura* dating from the first century of the Common Era. Vitruvius's discussion of architecture is an inspiration for engaging the various aspects/systems/organs of the animate organism. I want to consider the architecture of the neuron and then of the neuromuscular connections or proprioceptors, and the morphology of the skin-encased body. I want my gropings to be guided by the way Vitruvius described the three principles of architecture (by which he meant, of course, physical buildings) as: *firmitas* (or durability or robustness), *utilitas* (usefulness or functionality), and *venustas* (beauty, that is, the ability to delight people and raise their spirits). From these earliest statements of the principles of architecture to the present, beauty has been an essential criterion; simple functionality is, as suggested by twentieth century Swiss-French architect Le Corbusier, more appropriately called "construction," whereas the term architecture requires something that touches the heart and makes one happy; that is, something felt to be beautiful. Vitruvius inspires me to look at the neuron, for example as I will soon do in modest detail, to find not only a durable functional form that gets the job done, but one that in the elegance of its design, in its infinite intricacy and complexity alongside its simplicity and obviousness of function, is surprisingly also so fascinating and amazing that we cannot help but feel delighted, find our spirits raised, and be simply in awe of it. We'll see cleverness and surprise in the relationship between design and function, a sense of the infinite layering of complexities ever smaller in dimension as well as ever greater in implication. We'll be thrilled by the unexpected and seeming impossibilities that characterize its design and function. We will be astounded at our own capability of being inseparable from the constant presence of what I am calling copresence, the capacity as primary to our vitality to both distinguish things as separate constituents yet also to understand them to be entwined, unified, inseparable.

We must see the architecture of these many aspects of our own animate humanness, in nothing short of these terms: that beauty characterizes a certain conjunction of form and function. I rather like it that throughout the history of its use the term architecture has not been limited to mere stone and mortar constructions, but it has also applied to all those structures and processes that engage something that affects, that delights, that evokes happiness; that is, structures that are beautiful. As I attempt to describe the shape and functionality or workings of various neurobiological and human structures and systems, it

will be with an accompanying attentiveness to my heart as it responds to the marvelous conjunction of form and function, repeated and iterated in fascinating fractal-like patterns from the small to the large. This recurrence, this familiarity in the vastly dissimilar, is a key idea with which I must begin. To approach neurons (for example) in this way is to get to the heart of the matter.⁶⁴

⁶⁴ It is of perhaps passing interest that a federal government sponsored study of the humanities as they are represented in American education produced a report titled "The Heart of the Matter." [cite] What I found fascinating about this report is how fundamental the assumption of the distinct separation between the humanities and the sciences. The report seemed to attempt to "justify" the humanities by invoking the soft and romantic metaphorical language of "heart" to keep the hard materialist reasoned factual work of the sciences from some heartless reduction. The failure of the study to demonstrate a copresence of humanities/sciences resulted, at least in my reading, in an empty gesture that will do little to offer any compelling force to the humanities. The failure is as well a failure to appreciate the integrity of the whole preferring an approach to fix what is assumed to be broken.

2 Neuron and Synapse

the nervous system is merely a [part of a] mechanism by which a muscular movement can be initiated by some change in the peripheral sensation, say an object touching the skin
- Lockhart, Hamilton, and Frye

the brain is an organ of and for movement
~ Roger Sperry

You are More than Your Brain

I am not satisfied by the popular reductionist brain studies, at least the kinds of studies that reduce everything we are and do to some function of the brain. These studies present the brain as the chief administrator and decision-maker, hierarchically at the pinnacle second to nothing else in the complex organism we understand ourselves to be. The implication of this common and widely popular view of the brain is that if we can understand how our brains work then we'll understand ourselves.⁶⁵ There are enormously ambitious projects currently underway throughout the world to "map the brain" and to somehow replicate it with computers. The simplest calculations of what sort of storage and computing power is anticipated reveals how daunting are these projects to say the least. One study is attempting to accomplish this by linking together enormous computing systems throughout Europe in order to accumulate what is needed.⁶⁶ While it is tempting to consider a brain as a computer (regretfully I've done so myself at times⁶⁷), brains are not computers and to make that distinction is important for a variety of important reasons some of which will emerge in this chapter and others that will be explored later.⁶⁸ In fact, the more I understand about how the brain works along with how the many other biological systems that comprise animate organisms work all in parallel and reticulated, the more I am baffled by how, given this remarkably organic juicy mass of tissues and chemicals, the thing (us animate beings) works at all, much less to do so with any coherency. Simply put, I find it ceaselessly remarkable and amazing that we human organisms work at all. I admit that I obsess a bit on this question, yet I find it truly fundamental. It is not just the vastness of the biological systems—the complexity is what these huge computer-based brain-mapping efforts are attempting to replicate—it is more that the animate organism including the brain is all gooey and squishy and bloody and tissuey. All of the entwined constituents operate with untold variables in constant organic inconsistency that is wholly not replicable by circuits and switches. In contrast, computers are clean complexes whose silicone metal and plastic parts snap together. Any moisture or dirt or goo will quickly destroy a computer circuit. How do computers replicate mucous

⁶⁵ Some examples like the book in kid's brains Barbara Strauch?? Doidge Patricia Churchland, etc.

⁶⁶ Ref to Europe's brain map project.????

⁶⁷ And Michel Serres does so and I'm a huge admirer of anything of his.

⁶⁸ A strong argument for this position is "Your brain does not process information and it is not a computer" Robert Epstein | Aeon Essays" June 19, 2017.

and pee and poop and hypertension and cancer and low self-esteem and lust and hate and anger and toxins and the feel of one's lover touching one's face and the smell of your baby's head and the feeling of the sound of music and the ever-present edge of danger that any moment could be the last one, much less replicating self-movement of unbelievable complexity that can gain brilliant beauty in forms like skate boarding, ballet dancing, playing basketball, or walking? How do computers experience color as does a Mantis shrimp whose eyes have thirteen kinds of color sensors compared with the human three or even as a colorblind teenage boy? Even more importantly, as it is my focus in the first section of this book to demonstrate the ubiquity of copresence in animate organisms, that is, the capacity that I believe is inseparable from vitality to embrace entwinings of distinctnesses, the two that are one, it seems that it is precisely this dynamic processual relationality that distinguishes tissues in movement most radically from circuits and breakers where two that are one is a shorted circuit or an irresolvable conflict, a program bug, that leads to a systems failure or an infinite loop. As amazingly complex as are computers, the basic electronics operate on entirely different kinds of principles and mechanics and materials as well as on a wholly simpler order of complexity.

Alva Noë, in his book with the fun title *Out of Our Heads: Why You Are Not Your Brain, and Other Lessons from the Biology of Consciousness* (2009), observes that neuroscientists like Nobel laureate Francis Crick and neuroscience philosopher Patricia Churchland are harkening to an old deeply entrenched (I'd say gesturally naturalized) position in their declarations that "we are our brains." Noë reminds us that Crick wrote, "you, your joys and your sorrows, your memories and your ambitions, your sense of personal identity and free will, are in fact no more than the behavior of a vast assembly of nerve cells and their associated molecules."⁶⁹ Similarly Churchland wrote "The weight of evidence now implies that it is the *brain*, rather than some non-physical stuff, that feels, thinks, decides."⁷⁰ "Nonphysical stuff"? Although Crick calls his hypothesis astonishing, Noë suggests that "it isn't surprising to be told that there is a thing inside each of us that thinks and feels and wants and decides" tracing such a view to seventeenth century notions of Descartes. And Noë notes further that "we have no better understanding of how 'a vast assembly of nerve cells and their associated molecules' might give rise to consciousness than we understand how supernatural soul stuff might do the trick."⁷¹ "Supernatural soul stuff?" I'd suggest right off that the Humpty Principle plagues all of these views, including Noë's, by starting out with antagonistic oppositions.

Of course, Noë doesn't deny that brains play a role in consciousness and thought, but he proposes a hypothesis that shifts the focus. He proposes that "to understand consciousness in humans and animals, we must look not inward, into the recesses of our insides; rather, we must look to the ways in which each of us, as a whole animal, carries on the processes of living in and with and in response to the world around us. The subject of experience is not a bit of your body. You are not your brain. The brain, rather, is part of what you are."⁷²

⁶⁹ Quoted in Noë, *Out of Our Heads*, p. 5.

⁷⁰ Quoted in Noë, *Out of Our Heads*, p. 6.

⁷¹ Noë, *Out of Our Heads*, 6.

⁷² Noë, *Out of Our Heads*, 7.

So how does Noë come to his “truly amazing hypothesis”? To my reading he simply begins with it as a hypothesis: “Meaningful thought arises only for the whole animal dynamically engaged with its environment, or so I contend.”⁷³ And also “Consciousness requires the joint operation of brain, body, and world.”⁷⁴ As I will develop more fully later, I tend to avoid, especially at the outset, notions like “meaningful thought” and “consciousness” because, as I read those writers who attempt to locate consciousness (and currently they seem countless), they all tend to define consciousness at the outset in a way specifically tailored to what they expect to find, to support the position they wish to establish. And as for the term “meaningful thought” I can’t help but wonder, reflecting on my own all too common experience, if “meaningless fuzzy impressions” should somehow be discounted; and I’m increasingly convinced that meaning is close to meaningless.

What compels us to seriously consider Noë’s hypothesis that we must account for the organism dynamically engaged with its environment? Churchland and Crick would surely agree and yet insist that this dynamic engagement is simply the result of what is going on “in one’s head.” Why is this brain-centric view not adequate? Noë’s book presents evidence of the dynamic engagement; yet, interestingly he doesn’t discuss how the brain is integrated somehow with all other aspects of the organism in the processes of engagement. And Noë doesn’t discuss self-movement at all even though it must be present in his notion of an “organism dynamically engaged with its environment.”⁷⁵ So while I agree with Noë’s hypothesis as broadly stated, I think it lacks an adequately compelling argument that the brain is not the controller and master and the location of our self and consciousness. I believe as an alternative that the discussion of the primacy of self-movement I have initiated provides that compelling argument. It shows, as it must, that brain architecture has emerged through distinctive evolution based on eons of self-moving experience, that brain functions are shaped to enable self-moving in the specific ways that body and modes of motility co-evolve, that concepts and images find their formulation in self-moving/touching experience, that self-moving is impossible apart from an other (an environment), and importantly that movement does not (Barbaras holds that it can not) come from something not moving—moving is living, moving is both the animateness and the organicity of animate organism.

American philosopher Maxine Sheets-Johnstone provides several key examples of neuroscientists that foreground movement and the importance of the whole organism. She notes that as early as 1952 Nobel laureate Roger Sperry understood “the brain as an organ of and for movement.”⁷⁶ And she also quotes neuroscientist J. A. Scott Kelso as

⁷³ Noë, *Out of Our Heads*, 8

⁷⁴ Noë, *Out of Our Heads*, 10

⁷⁵ Sheets-Johnstone is insightful on the shortcomings of Noë’s approach. She writes, “While the idea [of giving equal roles to brain, body and world] ... is to demote the brain from its preeminence and conceive it instead as one ‘player’ en par among others, the critical point is missed, namely, that the brain is neurophysiologically—*functionally considered*—an integral part of the nervous system and the nervous system is indeed *a singular system*, one spanning the entire body from head to toe and dedicated centrally to the coordinated dynamics of living bodies.” 491 (ital. in original).

⁷⁶ Sheets-Johnstone, 371 From Sperry 1952 “

writing in opposition to a representational view of perception and pointing to the importance of coordination dynamics (I'll develop this approach later) that "It is important to keep in mind . . . that the brain did not evolve merely to register representations of the world; rather, it evolved for adaptive action and behavior. Musculoskeletal structures coevolved with the appropriate brain structures so that the entire unit functions together in an adaptive function."⁷⁷ Kelso's work on coordination dynamics is of particular interest, as I will consider much more fully later. This is the study of how all this complexity can somehow get itself together to accomplish coherent behavior (typically as smooth movement) and experience, thus addressing that issue that persistently haunts me.

As Sheets-Johnstone notes, Kelso's work develops on the classic work of Nobel laureate and neuroscientist Sir Charles Scott Sherrington. In the late nineteenth century studying muscle systems Sherrington developed what has come to be known as Sherrington's Law, for which he, along with Edgar Adrian, was awarded the Nobel Prize. They showed that when one set of muscles is stimulated, muscles working against the activity of the first will be inhibited. This law was expanded to include the whole organism by his early twentieth century theory that the nervous system acts as the coordinator of the various parts of the body enabling the entire body to function toward one definite end at a time holding up the reflexes as the simplest expressions of the interactive action of the nervous system.⁷⁸ In this tradition, Kelso describes a "twinkling metastable mind" (Kelso's term inspired by Sherrington) that is characterized by "co-existing tendencies at all levels of being, i.e., tendencies to bind together and to maintain independence, whether the elements under investigation are living creatures or neurons in the brain."⁷⁹ This tendency to at once "bind together and to maintain independence" is precisely what I have been referring to as copresence and Kelso anticipates what I intend to develop by showing that this tendency occurs everywhere on neurons (the central subject of this chapter) to many other aspects of living creatures (the subject of the next several chapters). The research trajectory from Sherrington through Kelso on coordination dynamics is of enormous importance as a progressively developing background to this perspective.

Focused on movement Sheets-Johnstone connects Kelso's findings with Sherrington's to establish that movement has primary. She writes "Not only is the meaningful pattern dynamic, but the harmony of effective movement is, as Sherrington explicitly points out, 'not a harmony built out of parts in the sense of [being] merely a product of harmonious parts.' On the contrary, and in accordance with Aristotle's concept of *form*, the living moving system is itself 'the cause of the harmony of its parts.'"⁸⁰ As I will develop much more fully later, smooth movement is foundational to the experience of coherence. The living movement is copresent with neuromusculoskeletal systems, entwined in processes that achieve coherence in experience and in movement. Looping, entwining, reticulating, gapping are all ways of articulating copresence. Beginning with self-moving, philosophy and biology also twine; and rightly so.

⁷⁷ Sheets-Johnstone, 389 note 13 from Kelso 1995:268.

⁷⁸ Sherrington, 1906 ????

⁷⁹ Sheets-Johnstone, 484 referring to Kelso 1995: 112, 225, and Kelso and Engstrom 2006: 148.

⁸⁰ Sheets-Johnstone, 484 quoting from Sherrington 1953, 180.

Kelso does us non-specialists a great service by helping us understand the limitations of the widely popular presentations of the results of PET scans (positron emission tomography) and fMRI imaging (functional magnetic resonance imaging) when he writes, “Neither the brain nor its individual neurons are linear. . . . When one examines brain images before they are subtracted from each other, one sees activity distributed all over the place. There are no centers for reading and speaking, even though each task may selectively involve *in time* certain areas more than others.”⁸¹ The limitations of these processes have also been described in *Brainwashed: The Seductive Appeal of Mindless Neuroscience* (2013) by Sally Satel and Scott O. Lilienfeld. Linearity is the characteristic of the “wiring” analogy in popular descriptions of neurological processes. Nonlinearity indicates a lack of predictability. Kelso notes that these scans and images reveal that activity is distributed throughout the brain, it is reticulated, not linear. Kelso and Engstrøm’s work in coordination dynamics will be important to my discussion of the reentrant (implying inward or within the brain) brain functions. Coordination dynamics refers to the constant activity across the whole brain discussed by Nobel laureate Gerald Edelman. All these works suggest that it is by means of amazingly complex systems that communicate in nonlinear metastable networks spread throughout the brain that remain directed toward the brain functioning itself, but also similar processes found throughout the entire organism that offer sufficient coordination that the composite of parts functions as a coordinated dynamic whole, that is, that we are coherent beings with mostly coherent, if complex, experience. Perhaps of even greater importance than identifying some pinpoint areas in the brain that can be attributed as the seat and cause of some specific action⁸² is the fuller realization of how reticulated and internally interconnected are the brain, the nervous system, and also the entire organism and its interdependence with the environment.

Neuroscientist Steven Rose writing on *The Future of the Brain: The Promise and Perils of Tomorrow’s Neuroscience* (2005) discusses another limitation to this notion that the brain in the skull is all-important. He considers what it would mean if neuroscience could, in a perfect world, observe a brain in the utmost detail including the impossible mapping of the entire history of this particular brain from conception to the moment this brain is engaged in the process of deciding whether an argument is true or false. “We will expect all sorts of brain regions to light up [implying PET subtractive scans or fMRI images] as some proposition is examined, syntactically, compared with related propositions extracted from memory, and so forth.” And we could also expect that the moment of decision could be detected as well. But then Rose asks, “would it [the imaging and mapping system] be able to detect the actual *content* of the argument leading to the conclusion? I suggest not.”⁸³ Rose’s point is of utmost importance. Even if we could indicate where and that the brain is engaging concepts and memories and relational functions; even if we could chart that there is evidence in the brain that a decision has been made; even if we could identify a decision as yes or no; Rose argues that we still could not ever “detect the actual content” of the

⁸¹ Quoted by Sheets-Johnstone, 484, from Kelso 1995: 273.

⁸² These finds clearly have important medical value.

⁸³ Quoted in Sheets-Johnstone, 493 from Steven Rose, *The Future of the Brain* 2005, 219-20.

argument and isn't that what is of fundamental importance?⁸⁴ The stuff of experience and thought is the distinction I was attempting to articulate in that long list of common experiences at the beginning of this chapter.

The most problematic line of presentation, commonly heard, is to portray "the brain" as the initiator and controller of all action and behavior and thought—statements on the order of "my brain made me do that" or "actually it is your brain making that decision or feeling that feeling." This brain determinacy of all that we are engages the long discussion of the nature of free will. I'll consider this issue more fully in the **final** chapter. That we can even seriously consider such statements likely has more to do with politics and history and theology than anything scientific, thus to me these are the principal aspects of such statements that deserve our interest. I'm completely curious as to how anyone could keep a straight face and say "my brain made me do it."⁸⁵ Such statements require us to consider our brain as something like a conscious homunculus that is separate from us, from who we are; our inner master independent from what we identify as "me."

I think there is widespread misdirection about the colorful results of many fMRI findings that show us specific brain locations, all lighted up, and claim to tell us that we now know the source of certain actions or behaviors, implying that these little locations establish the director and controller role, the independent agency, of the brain. Despite the purely illogicality and impossibility of these implications, I believe that the general architecture of brains, their basic design, reveals much that is inspiring and important. In terms of Vitruvius's principles of architecture, we can consider it beautiful. The writings of Sherrington and Kelso and Edelman and many other neuroscientists endlessly fascinate. While I find many references to the role of the brain in studies of cognitive processes and even of motor functions, most either talk mainly of the brain as a single yet complex mass or they are focused on showing that specific areas of the brain have explicit causal functions. I don't discredit either because I certainly think we learn more either way. Yet, what I have in mind is perhaps a bit more aesthetically directed and focused more on the basic architecture of the most foundational brain components: neurons and synapses. I delightfully find that neuron/synapse architecture corresponds with the principles of copresence I have introduced in terms of self-moving and with the basic architecture of many other constituents of the animate organism.

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⁸⁴ This mapping would, I believe Rose is saying, rather like a computer program, like the word processor I am using, determine the grammar and spellings of a communication. Yet, such a system cannot begin to comprehend the content of what I am writing or its nuance.

⁸⁵ I frankly think the whole science/religion matter is stuck on this example of the Humpty Principle. A recent (2014) book *Why Science Does Not Disprove God* by Amir Aczel reminds me that this matter simply won't go away. I'm tempted to spend some time to reflect on this, but that wouldn't make it go away because it is so gesturally naturalized to us at this time.

Architecture of Nervous System

The nervous system is commonly understood as comprised of two major divisions. The *central nervous system* is that portion encased in bone, essentially the brain and the spinal cord. It is remarkably complex and fragile, yet amazingly plastic and adaptable and tenacious. The *peripheral nervous system* is everything in the system outside the areas protected by bone. This peripheral part is found in every part of the body's interior and skin. A strong distinction is commonly made between the central and peripheral portions of the system. This division is evident in the current remarkable popularity of the *brain*, just one part of the central nervous system. The brain is the subject of endless popular books, perhaps because of its association with memory and with the memory disorders and diseases. No doubt an aging population concerned with these disorders is driving the interest in memory and memory loss and subsequently the brain. Certainly also the advances in imaging technology have given vivid colorful pictures of the brain that tantalize our imagination. However, it is important to understand that neurons have the same basic architecture no matter where they are located in the nervous system and that the axons and dendrites of neurons in the central nervous system extend throughout the body. The divisions in the nervous system are more a matter of physical location than of function, at least in general terms. I suppose the division has come to be also a matter of aesthetics. It is so common to see a scientist holding a whole human brain in her hands or the endless depictions of colorful brain images. I suppose these images suggest aesthetically the centrality and unity so essential to the commonly held notions of control and dominance attributed to "the brain in the skull." This division even in the nervous system correlates with the long western history of dividing thought and action, mind and body, mental and physical; all notions that are ultimately not supportable or, I might add, all that interesting.

Neuron & Synapse

It was in the process of Nobel laureate Sir Charles Scott Sherrington's studies of *the integrative aspects of the nervous system*, the title of his classic 1906 monograph, that he concluded that "The characters distinguishing reflex-arc conduction from nerve-trunk conduction may therefore be largely due to intercellular barriers, delicate transverse membranes, in the former. In view, therefore, of the probable importance physiologically of this mode of nexus between neurone and neurone it is convenient to have a term for it. The term introduced has been synapse."⁸⁶ "Synapse" is from the Greek to clasp, connect, join.⁸⁷ Quite amazingly, if I understand Sherrington's work here, is that, in his efforts to understand the coordinative aspects of the nervous system, he developed his work beginning on the observations of movement, this case the reflex arc or the movement response to nerve stimulation that moves from the site of stimulation to the cord and back to muscle and movement requiring a connection between the sensory and motor neurons involved. The question, for me, is why Sherrington concluded that these neurons were

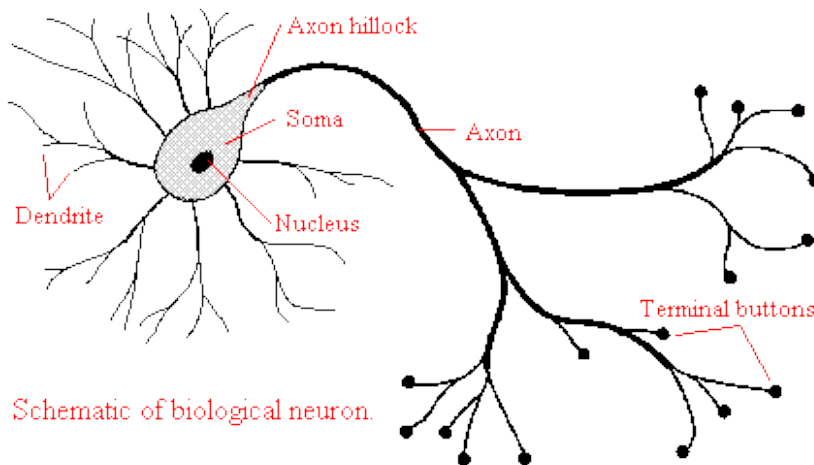
⁸⁶ Sherrington 1906.

⁸⁷ A couple of years before Sherrington's designation of synapse Freud had described "the nervous system consists of distinct and similarly constructed neurones . . . which terminate upon one another." He referred to the points of termination using the term "contact barrier." LeDoux *Synaptic Self* 38-9 quoting Freud's *Project for a Scientific Psychology* (???)

separated by “barriers” and joined by “delicate transverse membranes” in the reflex arc in such a way that excluded a continuous physical connection that would seemingly facilitate the transmission from the site of stimulation to the muscle reaction. Perhaps it is in evidence of the timing of the involuntary movement, involving a short delay, that Sherrington made assumptions about the connection of neuron-to-neuron, concluding that, in contemporary terms, these could not be “hard wired” because of the reflex time, short but having measurable duration nonetheless. And, of course, the two are separated again immediately after the connection is made. Neuron must be separated from neuron by membrane barrier, he concluded, and the connection between neurons must be “nervous conduction being preeminently . . . chemical rather than a physical.”⁸⁸ Importantly then Sherrington’s proposition of the necessary existence of the synapse is based on his study of the way the nervous system coordinates muscular behavior with external stimuli; synapses based on chemical rather than physical connection are deduced from movement behavior and of course have been confirmed by developed imaging technologies. The architecture of neuron/synapse as revealed by Sherrington is *inseparable from movement*, rather than from an analysis of thinking or cognition or intellection. The test of the reflex by hitting a reflex point and observing muscular response is a simple way to gain a general sense of the health of the nervous system.

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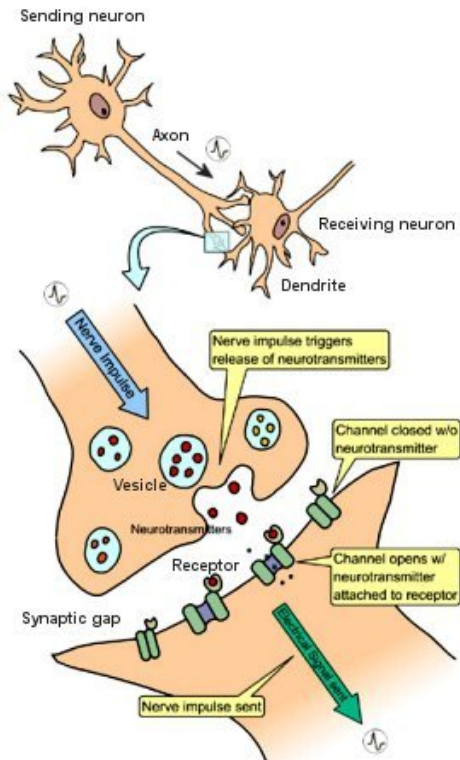
With this background to the synapse in mind I want to review the basic architectural features of neuron/synapse.

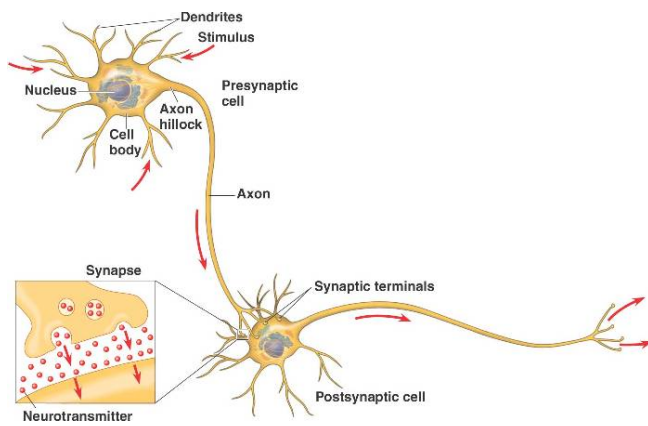


In its most basic articulation, the architecture of a single neuron involves a membrane-contained cell body with a nucleus with branching tubular fibers of two kinds, dendrites and axons. There is usually a single axon, yet it branches repeatedly as it reaches out to touch or make connections. There are commonly many dendrites (the term derives from the Greek word for “tree”) reaching out from the neuron cell body, each also branching

⁸⁸ Sherrington, 1906

repeatedly in a tree-like fashion, to be touched or to receive connection. The terminus of the axon contains synaptic vesicles, storage pouches for neurotransmitters (chemicals). At the terminus of the dendrite are receptor channels that are opened by the presence of neurotransmitter chemicals coming from an axon. When these channels open the charged ions in the dendrite change their charge resulting in the transmission of an impulse (action potential) across the neuron.





In a way, to make the most important point here, even though we know that the complexity of the neuron is almost infinite, I need now describe no more (although I will a bit later). I'm well aware that this minimal description is drastically simplified, but I hope it is not inaccurate. It is rather like describing Chartres Cathedral as a big box with some sides that have colorful stuff covering openings, with some pointy things sticking up on another side, and turned a certain way the whole box is shaped like a cross—simplified, yet accurate. Still the architecture of a neuron at this simplest level tells us much.

First, it seems almost obvious, yet I think it important to note, that a single neuron simply makes no sense. A single neuron is rather like a single telephone device. Imagine that! What could it possibly be for other than to communicate with another such device? There simply has to be another for it to make any sense. The architecture of a neuron demands and requires the pairing with other neurons and its design actually specifies the connection in terms of direction and orientation of the connection. A dendrite extends out to receive something that it cannot itself supply. An axon terminates in a readiness to project out something beyond itself; a prosthetic urge. Neuron needs (or perhaps Barbaras's term "desires" is preferable) neuron, yet end to end with a one-way directional implication. Amazingly Sherrington determined that these communicating neurons had to be separated, each contained by a membrane. They cannot physically merge with one another like two Lego blocks snapped physically together. There have to be two, they have to twine, yet they cannot merge and lose a sense of separation/separateness. The very freedom within the network of connections is inseparable from the gap that separates (and also joins) them. Without the gap, the whole system would lose much of its openness and variability; its freedom. One of Sherrington's great discoveries is the necessary separateness that is maintained even in the connection. This metastability is the essence of the synapse. Fundamental to neuron/synapse architecture is copresence, a reaching out both to give and to receive, yet, since these reachings are clearly distinct by form and function, the direction of the flow from sender and receiver is designated and determined. There is a distinct membrane boundary to mark the integrity of the neuron that clearly separates it from, yet opens it to, its necessary neighboring neuron. This boundary necessitates a

space, a gap, a synaptic gap, between neurons, otherwise there is no need to reach out either to *touch* or be touched.

The integrity and properties of this boundary (as I'll discuss as synapse) say much about the nature of touching. Touching always is a desired/imagined oneness of a twoness; touching is at the core of the idea of *unity* or the *organic*. That is, there is always a separation (a gap that cannot close), that corresponds with the urge, the desire, the function, the action to connect, to become one. And where there is reaching out, where there is touching, where there is a sense of a desire to connect, where there is a sense of directionality based in the architectural designations of giver and receiver, this is the condition of and necessity by design we know as *movement*. We could well say that the design is the product of movement, actual musculoskeletal movement; but also the virtual movement of neurotransmission and action potential. As Barbaras indicated, this urge, this "desire," to cross a space or distance between, to join what is two into one, is the very definition of movement, of vitality. Indeed, movement is the virtual action that is the heart of the neuron/synapse architecture. At base the architecture of the neuron is inseparable from movement both within the neuron and movement from neuron to neuron. The integration of the durable form of the neuron with its essential function constitutes, as we come to appreciate it, the beauty that forever delights us as it also literally enlivens us. Lockhart, Hamilton, and Frye in their *Anatomy of the Human Body*, wrote "the nervous system is merely a [part of a] mechanism by which a muscular movement can be initiated by some change in the peripheral sensation, say an object touching the skin."⁸⁹ It is precisely this attempt to understand this mechanism that led Sherrington to hypothesize the synapse.

The basic architecture of the single neuron is not limited to a single axon and a single dendrite; rather there are complex branchings associated with both. The order of complexity challenges our capacity of comprehension. It is estimated that there are around 86 billion neurons in the nervous system with each neuron having up to a thousand axon connections with other neurons. Thus, not only does a single neuron make no sense, it also makes no sense for there to be two neurons or a single line of serially connected neurons with axon-to-dendrite along the linear chain. The architecture of a single neuron, comprised of enormous numbers of branchings of both axons and dendrites, suggests that neuron/synapse architecture makes sense only in the context of a complex twining network involving many-to-one and one-to-many possible connections and all of the variations in between. Yet fundamental to the architecture is that all of the connections are potential and variable rather than fixed and actual. Consider the permutations and combinations by which nearly 90 billion neurons can be interconnected with each having the potential for thousands of connections at varying distances; dendrites are relatively short in their reach, yet axons are up to a meter in length.

We have a strongly developed notion, based I would guess on the misleading analogy of neurology to electrical wiring diagrams, of a single linear path connection from source to terminus. For example, we so often hear that the stimulus to a tiny, yet specific, point in the brain is paired with a distinctive movement of a digit. This simple connection suggests to

⁸⁹ Lockhart, Hamilton, Frye 267. Quoted in Juhan, p??

us a “wire” that runs from a point in the brain to a particular muscle, similar to an electrical wire that runs from a switch to a light; close the switch and the bulb is illuminated. But then what of the countless other connections? Simple redundancy? There certainly is redundancy or multiple ways in which a single effect is achieved, often labeled **degeneration**. Yet, this degeneracy is far from accounting for the vastness of neurological complexity. It is to this massive proportion of neurobiology that exists beyond the linear point-to-point connections that I believe we should direct much of our concern; to the reentrant reticulated internal communication throughout the brain, the nervous system, the entire organism, and beyond.

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It is in terms of the gap or the dynamics of gappings that we begin to glimpse something of the beauty of this neuronal architecture. It is how the form and function are inseparable. Although he focuses, inappropriately to my mind, too narrowly on brain in *Synaptic Self: How Our Brains Become Who We Are* (2002), Joseph LeDoux, a neuroscientist, includes experience as a key to the synaptic process. Perhaps the most important line in his book to me is “What is remarkable is that synapses in all these systems are capable of being modified by experience.” The systems he names as included are “networks involved in sensory function, motor control, emotion, motivation, arousal, visceral regulation, and thinking, reasoning, and decision-making.”⁹⁰ While LeDoux does not focus much on the gappiness of synapse (I will never cease to be astounded and delighted by these gaps, but I’m guessing that for a neuroscientist the miracle of gaps has become naturalized), his discussion of how experience influences the actual synapse, the connection, is fundamental. It is in this synaptic mechanism—that is, that each synapse has variable and modifiable criteria— that repetition, redundancy, skill, plasticity, will/intention, and so much more are to be comprehended, if, for us nonspecialists, with but a seductive glimpse/peep. Note the location of all these attributes, synaptic criteria, is not a point or area that “lights up” on a subtractive scan, but the chemical processes constantly involved at trillions of synaptic gaps and these are not confined to the brain in the skull but exist through every part of the body. The gravity of LeDoux’s statement is that it is *experience* that shapes the synapses not the synapses shaping the experience; although, frankly I think we’ll always be better off seeing these two as copresent, as an oscillating resounding loop. Synapse and experience are separate yet twined in an essential way. The awareness of the variability of synaptic criteria and that these criteria are necessarily linked with experience and thus with behavior encourages us to acknowledge the primacy of moving and that change over time is fundamental to beginning to comprehend plasticity, intentionality, organicity, coordination dynamics and, of course, vitality. I’ll return to it regularly.

In order to better understand how experience influences the actual synaptic behavior it essential to describe in a little more detail some of the other aspects of the neurological process.

Neurotransmission and Action Potential

Given that, as we begin to grasp (better, catch seductive glimpses of) the architectural dynamics of a single neuron, we are decisively directed to complex networks of reachings

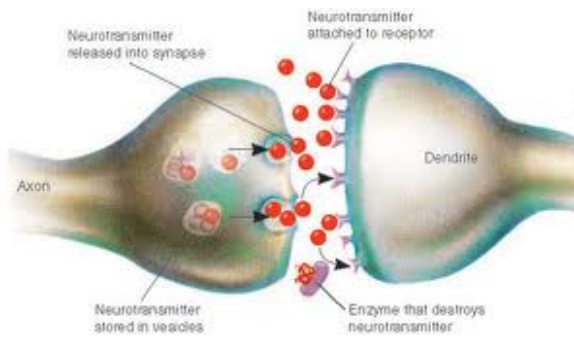
⁹⁰ LeDoux, 303

and touchings and movings, I want to describe in general terms the way these touchings and movings take place in and between neurons.

The cellular architecture of a neuron can be appreciated as a movement mechanism, but also for how to comprehend movement itself. Self-movement is synonymous with the functioning of the nervous system. To understand moving as living is to understand that biology is in one sense movement. Animate organisms come to life with groping and grasping sensory motor programs honed to the species by evolution and to the individual by experience. One purpose of the nervous system is to move muscles in response to movement-based sensation, either external or internal to the organism. Movement is fundamental and ubiquitous. Movement is the architectural designer as well as the objective of the design. Movement is so inseparable from neurology and sensation that it is often simply taken for granted. Yet we can look again to the neuron for inspiration and model, both into how the neuron accomplishes movement and touching and also into the key philosophical questions: “What is movement?” “Is it possible to consider the moving part of movement itself, as it is simply in process, rather than the effects or affects resulting from something moving?” I suggest that while there is an obvious impossibility of grasping, nailing down, latching on to movement—for these achievements surely will remove its most distinctive attribute, that is, the moving from movement—to make the effort is to foreground some important principles. I want to focus in a general way on the architectural elements of the neuron that are closely connected with moving and touching—neurotransmission and action potential.

“Information” (this is typically how it is described, yet even this term needs some reflection) is transmitted throughout the nervous system to accomplish the needs and actions of the animate organism; the neuron is an essential locus for understanding how this movement occurs. We might say that it is in the neuron and between neurons that purposeful movement occurs at the most elemental level in animate organisms. We might look here to attempt to catch a glimpse of moving itself.

All nerve cells are of the same general design while their connections with the function of the animate organism vary widely. The cell has a *cell body* containing a *nucleus*, *dendrites* (receiving connectors attached to fibers awaiting connections with other neurons), and an *axon* (thread-like fiber or tube that reaches out and then branches to connect with other neurons). Axons and dendrites interact as a close encounter, the temporary bridging of a *synaptic gap*. The difference in axons and dendrites physically corresponds with function. The way they interact determines the direction of the movement of electrical charge often considered to be information. A membrane that has amazing properties allowing transmission of chemicals in both directions across the cell membrane protects the cell. Surrounding the neuron are a great many kinds of fluid, some toxic and some essential to provide nutrients.



Where an axon of one nerve cell encounters a dendrite of another cell there is not a solid contact or physical/mechanical connection, but rather a close encounter of the touching kind characterized by a certain chemistry that crosses the tiny space or distance or gap between them, across the *synaptic gap*. Because of the balance of chemicals (potassium and sodium) there is a slight negative charge within the neuron when at rest. When the nerve at the connective end of the dendrite is stimulated by chemicals from the associated axon the membrane at the synapse allows the inflow of chemicals carrying slight positive charge resulting in brief ($1/1000^{\text{th}}$ of a second) reversal of the charge of the ions at the receptor point of the dendrite. The chemicals crossing the gap are neurotransmitters and these are immediately reabsorbed by the axon. The reversal of charge on ions in the dendrite causes the neighboring ions (they occur all along the inner surface of the tubes of these fibers) in the dendrite to make the same reversal in charge with this process continuing as a ripple across the neuron to terminate at the ends of its axon branches.⁹¹

The rapid reversal of the electrical polarity of the cell is a moving electric charge differential called an *action potential*. Where there are more positive than negative ions briefly in the neuron there is a movement of charge differential across the cell. The change in polarity in the neuron initiates a chain of events with the charge differential being carried through the tube-like structures of the cell to their ends where the axons meet the dendrites of other cells. The action potential flowing, although virtually, through the axon causes (given the appropriate synaptic criteria) a quick release (a spurt) of a neurotransmitter at the point of the synapse. This chemical crosses the distance between the axon and dendrite and effects the membrane of the receiving cell which quickly opens to the inflow of chemicals with positively charged ions thus reversing the polarity of that cell at the point of the synapse and transmitting the charge from the first cell to the second one and so on until the termination (in a simplified model) at a muscle cell (this too is another matter). The neurotransmitters are quickly reabsorbed into the transmitting cell to be used again. Neurotransmission speeds, which I'll consider much more at another

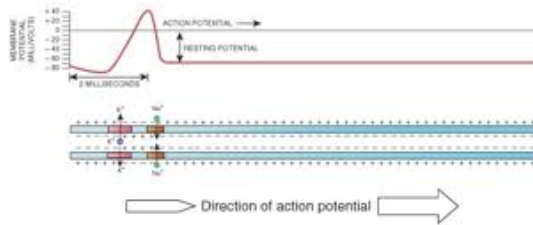
⁹¹ I'll discuss coordination dynamics in a later chapter, but the issue arises even in a single functioning neuron. Consider that a single neuron may be stimulated in close proximity by many connections with axons from as many neurons. These create action potentials across the cell, yet within the cell there has to be considerable coordination because not all axons even of a common neuron function the same. Remarkable.

time, are obviously rapid given how quickly we can act and react and remarkably amazing given their complexity. While variable, neurotransmission speeds are often stated as being around 250 miles per hour, yet they can be as slow as one mile per hour. While it is the rapidity that is usually the focus when discussing speeds of neurotransmission and action potential—we often use terms like “lightning fast”—what has persistently fascinated me is just the opposite. Again, I remind that I have been captivated by coordination dynamics, by how the complex organism manages any sense of coordination given the extent of the variables. For me one of the most important factors here is the *slowness* of neurotransmission/action potential. Were these speeds equivalent to electricity, as implied in our common reference to “wiring” as an analogy, there would not be an issues of coordination; well there would be plenty of issues, grave ones indeed, yet they would be of a different kind. However, when I do the math, I find that electricity travels about *three million times faster* than neurotransmission/action potential speeds; that is a fairly large number to me. That’s why we have observable reaction times even in a reflex arc that goes only from point of stimulation to the cord and directly back to the associated muscle. This speed concern will be an intriguing matter I want to consider further, but first I want to focus on the principles that seem to be operating here related to moving itself at this most elemental neurological level.

There are components involved that have clear boundaries, cells that are bounded by cell membranes. Yet, while there are barriers protecting the nucleus from toxins and harm, they also capture and invite into the cell nutrients and other chemicals for cell metabolism. This is movement for the maintenance of the life of the cell, for autopoiesis.

The design of the cell reflects its evolved purpose, to communicate with other cells, and all neurons both reach out to touch another one (actually many other ones) and reach out to be touched by another one (actually many other ones). We see a similarity between cell membrane and cell design, to separate and maintain separation yet to connect or entwine. Neurons are designed to be integral, whole, separate and distinct from other neurons. They are designed to maintain separation, if but a tiny one. Yet, neurons are selectively porous in both directions spurting out chemicals and sucking in chemicals; reaching out to connect with other neurons that it will never actually be able to touch (or fuse with) while patiently awaiting that virtual touch from a neighbor (or whole neighborhood) via the shower of neurotransmitters. Movement within the cell is initiated by the change of electric polarity that flows across the cell shifting the charge on the ions that quickly flip back. It is only the change in polarity (it is the proximity of the potential of difference that is why it is called *action potential*!) that moves across the neuron. Movement from neuron to neuron occurs across a distance, a separation, a gap, via a mechanism by which one cell tells the receiving cell to open its membrane barrier to ambient chemicals with positively charged ions. And the sequence continues on through the chain or better throughout the network. There may be a sense of a linearity in the action potential and the transmission of information through the nervous system, yet when the complexity of the many connections that occur in cascading complex networks of connections (accomplished by every neuron having a great many axon and dendrites branches) it must be seen as a dense circulating network much of it devoted to reentrance, that is to communicating within the network (I often think of it as gossip) rather than to eventuate in the direct pragmatic effect. The significance of this difference that counters popular “wiring” and “firing” images cannot, to

me, be overstated.⁹² The operative principles/conditions associated with moving are, again using Barbaras's terms, *distance* and a vectored (i.e., directionally intended) condition characterized by a *desire*.



On a larger scale the transmission of a signal to the muscle has the same contextual structure that correlates with the presence of moving itself or we might term this *living movement* to distinguish it from the chaotic flow of chemicals in the interstitial spaces surrounding the neurons. *Action potentials* are movements, yet it is not physical bits of information that are passed through some conduit; rather it is a virtual flow effected by the change in ion charge. The change amounts to oscillations since the ions flip their charge and then flip right back. The ripple of oscillation has the effect and appearance of movement from one location to another. We might ask what is actually moving? Is there anything at all going from one point to another? Is there anything equivalent to Zeno's arrow? An interesting analogy, helpful to me any way, is the apparent movement of messages on marquee signs composed of arrays of small light bulbs. It is the timing of the on/off condition of the lights that give the appearance of the flow or movement of words or pictures across the marquee. The movement is apparent or virtual, not actual. The difference from this analogy in the action potential is that in the ion polarity shift it is the difference in charge of the adjacent ion that causes a neighboring ion to change its charge rather than some overarching master controller.⁹³ The same principle holds as well for almost all electronic displays where pixels are on or off or have a fixed number of conditions (such as colors) that can be selected offering the appearance of movement. The difference is that in the sign or the electronic display there is not "awareness" or actual connection from one pixel or bulb to the next wherein this connection—the action of the adjacent other—is the heart and nature of the nervous system. This attempt at an analogy with wiring shows its potential for creating misunderstanding. In action potential there is no controller and there is no physical thing actually being carried along; movement is

⁹² Juhan has an excellent and extended discussion of this analogy, its dangers despite its attractiveness, *Job's Body*, 155-57.

⁹³ There is the issue of what causes the flip of an ion by the adjacent ion ... I believe that this has to do with the static state of the ion charge in the neuron. What causes the ion to flip is the non-static state of the adjacent ion. This is the excitatory effect of one ion on the adjacent ion. Probably some deeper physics/chemistry involved here as well.

virtual. The virtually connected presence of difference at a distance without measurance is moving itself.

Excitation/Inhibition

While this entire system is amazing beyond imagination—how dare we suggest we know much of anything about it?—it gets even more amazing when we learn what is going on in the synapses. Recall that there are complex and plastic synaptic criteria. Again, the commonly used wiring analogy has prepared us to expect that either the switch is open or closed, the charge is either flowing through the circuit or not. But nothing could be farther from synaptic magic.

The complexity of all that goes on at the synaptic gap that eventuates in a synapse and the initiation of an action potential in the receiving neuron is so rich and varied that neuroscientist Joseph LeDoux in his 2002 book *Synaptic Self* considers the synapse to be the seat of the “self.” It seems that at the synaptic gap the behavior of synapse is determined by accumulating criteria shaped by the experience of the whole organism. Indeed, it might be possible to see physically based changes in synaptic criteria as the residence of the accumulation of experience. The importance of these synaptic criteria can scarcely be overstated particularly when the plasticity of the criteria is taken into account. Neurotransmitters may excite or inhibit the synapse. There are thresholds that must be surpassed, like tipping points, that may involve a variety of neurotransmission strategies for a synapse to occur. There are criteria that exist at the synapse that change with neighboring synaptic behavior and with repetition and with countless other factors. This accumulation of synaptic criteria is inseparable from plasticity as well as the reliability of skill. These complex criteria and behaviors led LeDoux to see the synapse as the focal points in “networks involved in sensory function, motor control, emotion, motivation, arousal, visceral regulation, and thinking, reasoning, and decision-making.”⁹⁴ As unbelievable as this sounds it certainly correlates with the synapse being a gap rather than a switched hard connection. The remarkable complexity and diversity of the whole organism is replicated at the synapse. The gap enables the fluidity and flexibility and variations that must obtain for there to be coordination across complex systems. I’ll suggest that it is in this gap of the synapse, but also in the micro-duration of the coordination dynamics, that our moving life flows.

Understanding this mechanism a bit may provide a firmer sense that this process isn’t just fantasy, though always fantastic. Action potentials, the flows of charge differentials across the neuron, are themselves never partial. They either occur or not. However only rarely is the action potential of a single axon of a connecting cell sufficient to initiate an action potential in a receiving neuron. What must occur is the accumulation, called *summation*, of impulses to a threshold or a tipping point in order to trigger the action potential of the receiving cell. One way of achieving the tipping point is for one or a small number of axons to rapidly pulse action potentials that accumulate to finally trigger the action potential of the receiving cell. This type of summation is called *temporal summation*. Alternately impulses from many cells may simultaneously stimulate the receiving cell achieving a *spatial summation* that triggers the action potential. This summation requires many axons

⁹⁴ LeDoux, *Synaptic Self*, p. 303.

of different cells operating conjointly on a single receiving cell. Now if this squishy hydraulics isn't complicated enough, there are wide differences in the effects of various neurotransmitters that are involved in the summation process. While we might assume that they all act the same way to just open the door so the action potential can be initiated, they do not. Some neurotransmitters are referred to as *excitatory* in that they do just that, that is, they excite the receiving dendrite receptors to open. But other action potentials terminate in the transmission of *inhibitory* chemicals that dampen the likelihood of the dendrite receptors to reach the triggering threshold. And, as I'll soon briefly describe, since there are many (a remarkably understated term) axon branches and dendrites for every neuron connecting to various neurons and since even in the same neuron axon branches these may vary in terms of being either excitatory and inhibitory, this is a wildly complex process involving conflict, threshold tipping points, and remarkable multiplicity. Summation is "a rather complex affair, and the conflicting influences from many sources must be algebraically processed instant by instant in order to determine the net effect upon any given cell."⁹⁵ Yes, a rather complex affair!

Many-to-One, One-to-Many

Neurons have many axon branches and treelike branching dendrites and these do not even necessarily all act the same way within the same cell in terms of their excitation/inhibition behavior. The relationship between neurons is not a one-to-one relationship but rather a many-to-one and a one-to-many relationship. Many neurons can connect to the same neuron or muscle cell. It is estimated that up to 15,000 neurons can synapse to a single muscle cell. And, of course, there can be many axon branches for any neuron that synapse with the dendrites of many different neurons. And given the perhaps folk knowledge that there are around 86 billion neurons in the average brain,⁹⁶ the complexity of these relationships and the cross-connections constitute an interactive network of starkly unfathomable complexity given the permutations and combinations of the connections and reactions that occur even between a point-to-point connection mapping area of brain to area of body. As I will show in a later chapter it is in imagining how this extensively reentrant system works and in its interconnection with other equally complex subsystems in the animate organism, that we can attempt to account for vital processes of perception and knowing in the terms of moving and touching.

If the nervous system were comprised of ninety billion neurons with trillions of synapses, a mapping would perhaps seem almost beyond possibility, yet graspable (who am I kidding really?⁹⁷). Yet we must add to this measure of complexity the awareness that thousands of

⁹⁵ Juhan, 155.

⁹⁶ While a common number widely cited by neuroscientists is 100 billion a recent study has determined this is a bit high. See "How many neurons make a human brain? Billions fewer than we thought" *The Guardian*, February 28, 2012.

⁹⁷ It is perhaps worth offering some analogies to help us comprehend the order of complexity in our bodies: If you paid out \$1 per second, to settle a \$1 million debt would take less than 12 days to pay off the debt. To pay off \$1 billion would take 32 years. Paying off \$1 trillion at a dollar every single second? Nearly 32,000 years. A trillion is a 1 followed by 12 zeros, like this: 1,000,000,000,000. A trillion square miles would cover the surface

synapses may occur for every neuron and that the behavior of all of these synapses is not one of either being on or off but rather a complex system of virtual connectivity involving algebraic functions engaging untold variables comprising synaptic criteria that are impacted by the history of experience and emotions of the whole organism as well as by neighboring neuronal behavior.⁹⁸ To even contemplate modeling such a system seems simply laughable; all the more so when proposing a model comprised of silicon and metal. What other possible response can there be?

Afferent/Efferent

Now imagine all of the neurons that comprise the nervous system. Half of these neurons have on balance more dendrites that are oriented outward toward the surface of the organism and more axons reaching toward the core (the spinal cord and brain). Neurons with this orientation propagate their action potentials inwards, a centripetal or afferent direction. These neurons originate with sensory endings of the body—exteroceptors in the skin, proprioceptors in the middle depth of the connective tissue in the muscles and ligaments, and interoceptors deep in the body's internal organs or viscera—and terminate in the spine and brain. Some of these neurons collect in pathways that transmit sensory information and are called *sensory pathways*. They deal with feeling and affect and are therefore referred to as *afferent*. In terms of our accounting of the various human senses, there are four distinct afferent pathways, one each corresponding to sight, hearing, taste, and smell. Self-movement and touch are not connected with specific dedicated sensory pathways in that they come from every part of the body. More on these later.

The other half of the neurons has the complementary orientation in the body. They have axons oriented outward, dendrites inward, a centrifugal direction. These pathways carry action potentials from the brain outward to the muscle cells where they are translated into physical movement, into behavior. Since these pathways effect behavior via muscles moving they are termed *efferent*.

A few more things need be said about afferent/efferent pathways for action potentials. There is no correlation between these two neuron orientations and the central and peripheral architecture. The distinction is an indication of orientation, not location. Both occur everywhere throughout the entire system. Thus, we must resist the tendency to think of the afferent pathways in the periphery and the efferent in the brain. This tendency may be associated with our common view that the brain makes us do things; a view I persistently resist.

More importantly, afferent and efferent neuron orientations interact with one another throughout the system. It is not a simple one-way process of unitary pathways for each;

of 5,000 planet Earths. A trillion people would be 10 times more than have ever lived (based on the Population Reference Bureau's very rough estimate of 108 billion humans ever). A trillion dollars is enough to give \$3,195 to every man, woman and child in the United States. But for a typical U.S. household, making \$50,000 per year, to earn enough to pay off a \$1 trillion debt would take 20 million years.

⁹⁸ See below Chapter 5 "Experiential Neurobiological Ensemblings"

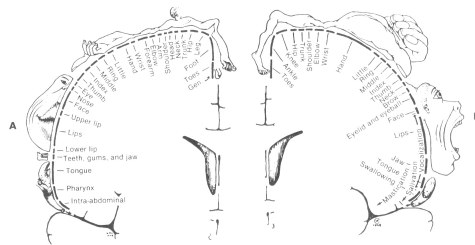
rather they are interacting with one another in a looping networking constantly adjusting manner. As Deane Juhan put it,

Sensation evokes movement, movement produces new sensations, these sensations then evoke and modify further movements, and so on around the track. Each side of the circle has many synaptic connections with the other side, connections which weld them into a single unit, like a spoke of a bicycle wheel. Sensory and motor activities are everywhere and at all times interpenetrating one another to create the homogeneity of conscious experience.⁹⁹

It is like, as Juhan says, a stream flowing in two directions at the same time although it is comprised of many streams intersecting one another. Our behavior and our sensation constitute a looping circular iterative repetitive interactive process of unbelievable complexity, based on movement and touch. To chart even crudely neuro-architecture is a way to help us comprehend moving itself. While our expectations based on the misleading “wiring” analogy encourage us to think of even this looping system as primarily a command and feedback loop—a pathway out and one back offering feedback—what will become increasingly important is our recognition that the overwhelming proportion of connectivity is within the system engaged in pattern formation and recognition and coordination dynamics that modify synaptic criteria.

“Fire Together Wire Together”

Among the most interesting and powerful aspects of the functioning of the nervous system is the conditioning of synaptic criteria based on their time-locked activity. This has come to be commonly referred to by the popular phrases “neurons that fire together wire together” and “neurons that fire apart wire apart.” Much of the attention of neuroscience, especially as it comes to the attention of the rest of us, is that there are areas in the brain that map directly onto specific parts of our bodies. This correspondence is often presented as a homunculus, or “little man,” overlaying the surface of the brain. The neurons



corresponding with the fingers of the homunculus map to the neurons that connect the brain to the motor neurons of our muscles of the corresponding body parts. Yet, as fuller information has become available, it has been found that the brain is not only comprised of a homunculus where tiny areas in the brain correspond one-to-one with body parts, but also that many functions of

the brain involve the simultaneous and seemingly coordinated activities of neurons at a distance from one another. Such findings are remarkably important in terms of understanding plasticity, but they also raise the question of how neurons at a distance can coordinate. These findings have shifted the way the nervous system has been understood—in the overly simplistic terms of one-to-one and the simple correspondence of brain parts to behavior and even things like belief—to recognizing that it is a highly

⁹⁹ Juhan, 162

complex self-adjusting plastic system that must be coordinated by reentrant (self-communicating) metastable (containing self-contradictions) processes. Coordination dynamics of great sophistication then has become the forefront in understanding the nervous system. This view of the nervous system, indeed, the whole neurobiological system or organism, will be fundamentally important to this book.

Copresence Evokes Beauty

Although this description of neuron/synapse architecture is partial and elemental some key ideas and principles have emerged. First, although the neuron is integral and whole, bounded, its very architecture reveals an essential relationship between structure and function and that is to connect and communicate both with the environment and with other like structures. Yet, to me most surprising (especially given the electrical wiring and internal combustion engine analogies that so powerfully shape our naïve understandings) is that the structure isn't what we'd (or at least I'd) expect. There isn't a riveting of one neuron onto another; a permanent weld or solid joint or even a physical switch. Rather, there is a reaching out to be touched and to touch. The connection is a juicy fluid temporary one that seems so fragile and also so sensual. Then the complexity of the neuronal connections with one-to-many and many-to-one numbering into the thousands for every single neuron turns this sensual touching into something of an orgy in that it suggests that every neuron is touching and being touched by (or has the equivalent of a desire to touch/be touched by) countless other neurons in cycling heightening rhythms. These rhythms come to resound, to oscillate together, with the accumulation of shared experience. There are gaps, interwoven networks, varying speeds and distances, varying criteria, cycling and recycling (oscillations and reverberations) of connections/information, movement within and throughout; yet not despite of but somehow because of this distinctive architecture there is coherence and relative smoothness.¹⁰⁰ From another perspective, we have to recognize that while a single neuron can be described, the very principles of its architecture demand that it is never just one; a unique cell; a single neuron is something like a single telephone handset. Axon demands dendrite, dendrite axon. The architecture of the neuron cannot be understood apart from the necessity of distinction and separation but also of connection and other. The architecture of neuron/synapse articulates a copresence; a necessary twoness/manyess to the desired and required oneness (oneness of a neuron cell as well as oneness of the entire animate organism). Neuron must be wholly separate and distinct as guaranteed by the membrane barrier at the synaptic gap; yet the whole construction of neuron/synapse is to connect, to touch and be touched. More amazingly neurons seem to have an awareness of one another (figuratively speaking, of course) as evidenced by the necessary coordination of synaptic behavior at a distance and that these connections are influenced by experience, shared experience. Copresence is defined by the architecture of neuron/synapse. To recall the guiding architectural principles I chose at the outset, this structural functional interdependence, this complex self-coordinating network, not only delights, it also amazes. The design is unexpected. It is elegant. It portrays, I believe, Vitruvius's very definition of beauty. We wouldn't, we don't, we can't build things like this. And, to me anyway, the total

¹⁰⁰ See Chapter 7 "Coherence"

unexpected character of the architecture of what is so very fundamental to our animateness, our vitality, simply must motivate in us a challenge and an expectation.

The challenge is to understand as much as possible the implied wisdom in these surprising architectural principles. Why aren't we constructed of hard-wired connections? Why aren't the connections simply on or off? What is going on in this vast complexity that seems unexplained from an input-output perspective that is a rather linear affair? How can a system so vastly complex coordinate itself in such a dynamic way? Is it overkill, incredible redundancy, superfluity, bad design, a creator with too much time on her hands, or have we overlooked something about the whole organism that is of the most fundamental importance?

The expectation is that should we begin to comprehend the importance of what makes the neuron/synapse architecture so distinctive and plastic and delightful and beautiful, we will discover these same principles replete throughout the entire animate organism as distinctive to it. It is not a matter of some principle of continuity, as suggested by Dewey for example, but a matter of pervasive fundamental architectural principles. This expectation is based, on the one hand, on our simplest comprehension of the structural and functional principles of neuron/synapse and, on the other hand, by our experience as animate organisms that we are coherent beings, that we somehow manage to function. Our expectations may also be heightened by how easily it is to describe neuron/synapse in the terms of movement and touch that are so fundamental to the vitality of all animate organisms. Surely the structural/functional principles of the neuron/synapse are also at play for the whole organism in its environment; should we expect any less?

While there is much more about the nervous system to consider, it is essential to postpone that discussion until after I have considered other aspects of the human organism. This delay is necessary to avoid the mistake that I think LeDoux makes by locating the "self" only in the synapse; it is the mistake of the assumption held broadly among neuroscientists and the general population that the brain or the mind is the locus of "self." As productive and interesting as these brain studies can be, I believe they fail to allow the brain to be essentially copresent with the many parallel systems in the living organism moving in its environment. Persisting in holding the primacy of movement, self-movement, as radically as possible do we find the way of avoiding considering our essential self as residing only in the bony jar of our skull.

Following the principles of Vitruvius, building surpasses simply construction to become architecture only when it achieves the ability to delight people and to raise their spirits. This principle, *venustas* is surely understood in aesthetic terms, as beautiful. Certainly, we must appreciate the animate organism—even in the terms of a crude description of the nervous system—as utterly delightful and having the power to raise our spirits. The utter and confounding complexity of neurons and the whole nervous system, the surprising principles of construction that rely on gaps and nonlinearity and metastability is indeed delightful. The tensions and randomness that somehow achieve coherence experienced as smooth movement and even a flow of thought is profound and stunning. All of these characteristics that distinguish our neurology are experienced as nothing short of beauty.

3 Touching: Tactility and Proprioception

The brain recalls just what the muscles grope for: no more, no less.
~William Faulkner, *Absalom, Absalom!*

there is nothing in the mind that has not been first in the senses
~ ??? Leibniz (see disc Serres "5 Senses" p. 5 for hist of statement)

Comment [S9]: First name

Since antiquity philosophers have contemplated what precisely one needs to affirm the existence of one's own being. In his 2009 book *Inner Touch: Archaeology of a Sensation* Daniel Heller-Roazen charts a segment the history of this issue in his fascinating chapter "Of Flying Creatures." Some of the important early philosophical considerations of "flying creatures" were thought exercises. Heller-Roazen traces this concern to the late tenth or early eleventh century in central Asia and the philosopher Avicenna who was apparently among the first to posit "the flying man." Avicenna's objective was to demonstrate that the soul was indeed totally independent from the body. He posited that should the body be floating in the air motionless with nothing at all to stimulate it, this floating man, as Heller-Roazen put it, "could not even perceive himself to possess a body: his external limbs and his internal organs remained as insensible as the perfectly 'temperate air' around him. But in this utter ignorance of all things corporeal, there remained something the suspended man could still 'affirm' with certainty . . . his existence . . . or 'the existence of his own being.'" ¹⁰¹ This approach to the flying man anticipated Descartes's "I think, therefore I am" as well as perhaps sensory deprivation tanks, not to mention the broadly held views since Descartes. It is also consistent with many religious views that tend to value the insubstantial soul or spirit over the materiality of body.

However, in 1754 French philosopher Etienne Bonnot de Condillac published his *Treatise on Sensation* in which he takes up the flying man, this time conceived as marble. His concern centered on the inception of knowledge raising the question "how could any being be expected to have remarked the fact of learning something for the first time, if until then, by definition, he truly knew nothing at all?" ¹⁰² The issue appears to be the genesis of knowledge. The question then is that without any predetermining influences what would constitute the first thing one would or could know? Condillac's approach was to posit a flying marble man, "a statue organized on the inside like ourselves, and animated by a mind deprived of any kind of ideas." This man, "all marble, was such as not to allow it to employ any of its senses, and we retained the freedom to open them, at will, at our will, to the different impressions to which they are susceptible." ¹⁰³ So we have a flying marble man capable of sensing, but not able to do so other than at the will of the philosophers controlling this thought-up marble man. Condillac's conclusion was that the marble figure needed a hand with which to touch himself and this self-touch would be the genesis of knowing, the bootstrap, so to speak, to all knowing. As Condillac understood it, the marble figure simply needs a hand. If we "give the statue the use of all its limbs, it will inevitably reach out to touch, and to touch itself: 'it will necessarily come to pass that, repeatedly, it

¹⁰¹ Heller-Roazen, *Inner Touch*, 221

¹⁰² As quoted in Heller-Roazen, *Inner Touch*, 222

¹⁰³ Heller-Roazen, *Inner Touch*, 223

places its hands on itself.' Then alone will it discover that it has a body."¹⁰⁴ It appears that Condillac anticipates Sheets-Johnstone's (and others') primacy of movement when he assumes that the man will "inevitably reach out to touch." Condillac described this experience, this event of sensation, further in these terms as he considered what happens when the flying marble man touches his chest with his hand. "Then its hand and its chest will be distinguished by the sensation of solidity to which each can be referred, and which puts each outside the other." And further he wrote, "Distinguishing its chest from its hand, the statue will rediscover its self in each of them, since it feels itself in both."¹⁰⁵

For my present concerns, the most important reading of Condillac is that, while he is concerned with touch ("places its hands on itself"), he does not seem to be limiting or even centering the touch experience on exteroception, the sensation of texture and temperature by receptors in the skin. Rather he says, "its hand and its chest will be distinguished by the sensation of solidity to which each can be referred, and which puts each outside the other." It appears that Condillac is referring to how the body is capable of responding to the encounter with objects, including one's own physical self, through muscular sensory mechanisms. Self is won by the experience of "other," even if that other is a kind of objectification of one's own body or some part of it. Touch may be contact on the skin, yet what is essential is "solidity," that is, mass. It is the hand and body encountering one another in movement that "solidity" comes to be known as the resistance to movement is sensed. We now know this as the functioning of proprioception, or in Heller-Roazen's terms "inner touch." Moving and touching are conjoined as inner touch in this sensation of solidity or mass.

This is not all that is important in Condillac's proposition. Note the dynamics of the ontogenesis of knowledge. "The statue will discover its self in each of them [hand and chest], since it feels itself in both." It appears that he is saying that the distinction of hand from chest occurs in a way inseparable from the ontogenesis of self, knowing, and perception, all grounded in feeling/sensation copresent with moving, particularly and necessarily self-moving. As the chest and hand encounter one another, it is the self that "knows" they exist as separate, "they will be distinguished," but both are sensed as parts of me, "it [I] feels itself in both." This copresence is fundamental and this is also an aspect of a near identity of moving and touching. Condillac, of course, anticipates Maurice Merleau-Ponty's well-known construction of perception on the basis of his analysis of one hand touching the other.¹⁰⁶ And it was Merleau-Ponty's comprehension of this same copresent implication that led to the development of his "flesh ontology."¹⁰⁷

The flying creature appeared again in philosophy in the early nineteenth century when yet another French philosopher Pierre Maine de Biran took up the issue. Maine de Biran advanced the discussion by holding that the creature did not even need to touch itself; indeed, he needn't touch anything at all. Merely by moving the creature would feel the

¹⁰⁴ Heller-Roazen, *Inner Touch*, 225, Quoting Condillac (source?)

¹⁰⁵ Heller-Roazen, *Inner Touch*, 226, quoting Condillac (source?)

¹⁰⁶ Merleau-Ponty lectured on Condillac (cite) and before M-P Husserl used the hand touching hand analogy. There are more ...

¹⁰⁷ Maurice Merleau-Ponty, *The Visible and the Invisible* ...

internal resistance to its own effort to move. He wrote, “Supposing that an individual is suspended in the void and that he shakes his limbs, or that he moves, he will necessarily feel a particular kind of impression, which is born of the resistance that his muscles oppose to him, and of the effort made to put them into play.”¹⁰⁸ In other words, self is born in the presence of resistance, resistance to itself moving, resistance that is an essential aspect of self-movement. When we move, we feel ourselves moving because in the act of engaging our muscles to move any part of our bodies’ skeletal muscles also engage the resistance of other opposing muscles. Importantly, we need understand that Maine de Biran was referring to “inner touch” not to the resistance of the hand in the surrounding air or something like that (not even his chest). He was anticipating what we know about the neuromuscular connections that involve proprioceptors. It is by means of proprioceptors—receptors in muscles, joints, and ligaments—that we sense, we feel, the inner tensions of action and resistance that occur in all bodily moving; this system provides us with the feeling of moving itself. It is at the sites of proprioception that pervade muscles, ligaments, and joints throughout the body that we find the organs of inner touch that are, following this line of argument related to flying creatures, fundamental to the genesis of knowing, perception, and self.

Moving and touching (understood in this complex sense of both exteroception and interoception) are characterized as copresence; self-moving is not touching yet cannot be separate from inner touch (proprioception); exteroception and interoception are separate yet inseparable. Moving, self-moving, provides the inner touching that constitutes the feeling from which all knowing arises. Yet, even here it is the experience of, the feeling of, the interplay of the twoness of movement/touching that gives rise to our certainty of unity, identity, self, “I,” “me,” because of the ownership of the felt sensation that can occur only with separation. My earlier suggestion that “I am self-moving” is preferable to “I move” was anticipated by Maine de Biran who recognized that self-moving implicates touching even without physical contact, at least proprioceptively active inner touching.

On the basis of this argument, we’d need to replace the Cartesian *cogito ergo sum* with “I am moving/touching, therefore I am” (*agito/tactus ergo sum*). The point is that perception, thought, and awareness cannot arise apart from self-moving/touching. Any awareness of “I” or thinking or perception or knowing cannot precede the “sensation” that occurs with, what is felt as, self-moving.¹⁰⁹

My objective is to establish that movement and touching are primary to neurobiological functioning and that these patterned experiences of self-movement and proprioceptively active touching form the basis for perception and cognition and awareness. Once self-movement and touching are established as primary we can reimagine, rebuild a number of things. First, we will remodel the sensorium so that moving isn’t left out altogether, but rather is foundational to all the senses and touching is not relegated to one of the lesser/lower or animal senses, but is, with respect to sensation, inseparable from moving. Second, there are accompanying insights in terms of what it means to be human both as we

¹⁰⁸ Heller-Roazen, *Inner Touch*, 229, quoting Maine de Biran where???

¹⁰⁹ Sheets-Johnstone reminded us ??? that when infants are born lifeless they are referred to as “stillborn.”

share life with all animate organisms, but also in providing us clues about how to comprehend and articulate what has, through evolution, given certain distinctions to us humans among our animal kin. And, finally, thus equipped we should be able to engage in the study and appreciation of cultures and religions without wringing the life (movement, touch, sensation, behavior, action, experience) and vitality out of them in order to study them. Life (objectively speaking) is when living isn't.¹¹⁰

To this point in this process I have focused the biological consideration of movement largely on the movement that occurs in and among neurons and how this movement corresponds with the insights of movement philosophy. While I have suggested that these principles and images apply to the entire human being I have focused primarily on groping and grasping, the movement processes by which human bodies innately reach out and touch the environment in the continual vital acts of creating and discovering self and other and how these movings also constitute interrogative as well as agentive aspects of our behavior. Where I have considered the synaptic connection between glial cells, via axons and dendrites, I have yet to consider how it is that we are able to connect with the world around us. This is in a sense an issue of transcendence in a banal sense; the issue of how we are at once separate from the world yet capable of moving beyond our containment to perceive and interact with the world. As I've suggested in the opening remarks on inner touching, movement and touch are clearly implicated, but we now must ask how, in modest detail, this connection process works in neurobiological as well as philosophical terms.

Architecture of Proprioceptors

It is fascinating that even where proprioception is discussed or mentioned by philosophers and even cognitive scientists I have found none that actually offers any sense of what these things actually are or how they work.¹¹¹ And interestingly I've discovered that a good many humanists don't even know the term. As with neuron/synapse even a general understanding of the architectural principles of proprioceptors is important and moves us beyond vague references. When we simply name the term and have no idea of the associated biology, as it seems is common to those few non-scientists who do refer to the

¹¹⁰ My work in DCR was to keep the dancing in the dance, that is to see dance not as a thing, backfilled and without moving, in order to study it. I used the "ing" for "dancing" rather than "dance" throughout the book. At some point, and I believe I was inspired by Massumi, I wrote "Dance is when dancing isn't" trying to catch the importance of the distinction in a memorable and clever way. John Thibdeau anticipated my present phrase and indeed I owe it to him in his review of DCR in ??? (1.1, p ...) when he recognized that my interest, while focused on dancing, is actually life, vitality.

¹¹¹ SJ as well as Massumi (I think) speak of this. Need to get refs. Yet he only near the end of this book does Heller-Roazen finally mention Sir Charles Scott Sherrington's nineteenth century discovery of what he called "our secret sense, our sixth sense," proprioceptors, the term itself left unnamed. And this doesn't even occur until close to the end of the book ... p. 25??

term, it leaves these processes a total mystery. When we gain a general understanding of the architecture of proprioception these processes become “magical.”¹¹²

In his *The Integrative Action of the Nervous System* (1906) Sir Charles Scott Sherrington introduced a fuller account of proprioception which he called “our secret sense, our sixth sense” along with exteroception and interoception.¹¹³ Against the background of the discussion of synapses, proprioceptors are fascinating in part because they are located at the points of conjunction of the nervous and the musculoskeletal system. Whereas synapses occur between neuron and neuron; proprioceptors occur between neuron and muscle as well as neuron and cartilage thus in the connection of nerves to muscle and to bone. Whereas neurons have the same general architecture wherever they are located, proprioceptors come in several kinds and do different, yet interdependent, things. Proprioceptors are sensors measuring the changing length of muscle fibers and the speed of change and tension associated with movement in the muscles; thus, they sense oppositional aspects of moving. Proprioception senses the dynamic qualities of moving and they do so importantly as the moving is occurring. Since we have difficulty measuring moving itself because it is never in any place, never subject to our typical means of measurement, proprioception is especially remarkable. Amazingly proprioceptors sense the qualities of moving during the processes of moving. Proprioceptors sense aspects of the encounter of the self-moving body with itself and with its environment including one body part encountering another and the environment. Proprioceptors measure in highly detailed qualitative terms the action/reaction encounter (touching) with the environment in terms of qualities of moving change. Proprioceptors are sensory nerve endings integrated with muscle fibers that pervade the musculoskeletal system.

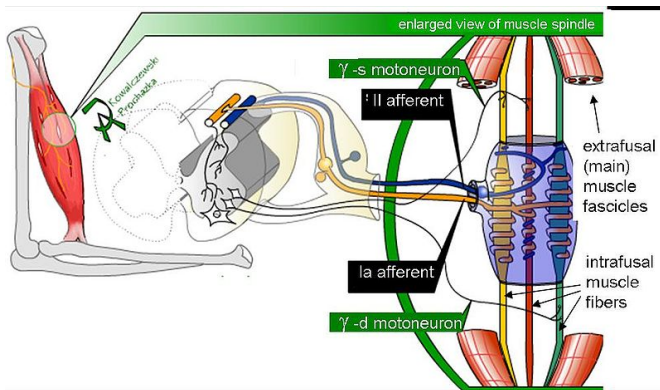
Proprius is “one’s own,” thus proprioception is perception of one’s own self and in common discourse as well as in practical fields like kinesiology and various forms of “body work” proprioception is usually referred to as the sense of relative position of body parts; it is also commonly associated with balance in being integrated with the vestibular system. But the implications of proprioception are much greater in that proprioceptors are where neuron

¹¹² I make these odd statements here both because I feel them to be accurate as well as because I want to assure that there is nothing reductionist, in any negative way at least, about attempting to comprehend biological processes and entities. I find, as I hope that I’m demonstrating, that this effort reveals depth and layers of provocative insight, while explaining away nothing.

¹¹³ Sherrington’s discovery was anticipated by a number of observations. In 1557 Italian physician Julius Caesar Scaliger described the position-movement sensation as a “sense of locomotion.” In 1826 Scottish surgeon and neurologist Charles Bell developed the idea of a “muscle sense,” one of the first descriptions of physiologic feedback mechanisms. Bell’s idea was that commands are carried from the brain to the muscles and that reports on the muscle’s condition are sent back to the brain. In 1880 English physiologist Henry Charlton Bastian suggested the term “kinesthesia” instead of “muscle sense” on the basis that some of the afferent information comes from other structures, including tendons, joints, and skin. German neurologist Alfred Goldscheider suggested in 1889 a classification of kinesthesia into three types: muscle, tendon, and articular sensitivity. See “Proprioception” Wikipedia.

and muscle are inseparable yet separate, where integral skin-encased bodies and the environment are inseparable yet separate, where self and other are inseparable yet separate, where excitatory and inhibitory energies are inseparable as tonus and posture yet separate, where the interrogative is inseparable from the agentive yet separate; where thought and action are inseparable yet separate; where touching and being touched, percipient and preceptor, proprioceptive and proprioceived are inseparable yet separate. Proprioceptors offer powerful exemplification and imagery of the two-that-is-one structurality (copresence) that is a core principle (at least as I am proposing) to vitality/living movement and to all our behavior colored and shaped by culture, history, and psychology.

All muscles throughout the body are full of sense receptors; this type of proprioceptors called *muscle spindles* is the most elaborate sensory structures in the body outside of the eyes and ears. Muscle spindles are at the heart of what makes possible all fine motor skills. A muscle spindle is comprised of from three to ten specialized muscle fibers surrounded by a protective sheath forming a spindle shape, that is, it is thicker in the middle and tapering to the ends. These muscle spindles, also called *intrafusal fibers*, are much smaller than the large skeletal muscles that surround them making up the belly of the muscle and that do the major work of moving bone and body. *Efferent nerve motor fibers* from the cord or brain enter the muscle spindle with the motor endings spread through the fiber. *Annulospiral receptors* (afferent nerve endings) enter the muscle spindle and wrap in spirals around the muscle fibers. These annulospirals are one type of proprioceptor. The gaps between the coils are sensed by these receptors measuring the *degree and speed of expansion and contraction* of the fiber they hug as a whole. It is here in the muscle spindles that the efferent and afferent sides of the nervous system have their closest physiological association. Their association is where movement and sensation are joined. Importantly the annulospiral receptors “feel” the movement itself; that is, as the muscle moves the annulospiral receptors feel how far and fast the muscle is moving as it is moving. Muscle



annulospiral receptors sense movement itself, living movement, not the measurant of backfilled territorialized movement effects.

spindles are then motor units that can feel *themselves* and this is a feature distinctive to them. The annulospiral receptors do not feel the effects of the movement of the skeletal muscles, that is the work they do or the effect they have, but rather they feel the moving muscle fibers as they move. This is a key distinction because the

The muscle spindles are connected to the spinal cord and to the skeletal muscles most immediately in the *spindle reflex arc*. The afferent nerve ending of an annulospiral receptor is at the end of an axon stretching out to the spinal cord. In the spinal cord this neuron synapses with nerves that carry the information about the moving dynamics of muscles to the brain, but it also synapses with the efferent skeletal motor neurons for the very same muscle being sensed; this is the connection Sherrington so notably considered when he posited the necessary existence of synapse and proprioceptors. This synapse allows a reflex arc that goes from muscle spindle (intrafusal) to the cord to return directly from the cord to stimulate the skeletal muscle in which the spindle is located without going all the way to the brain. There are of course other synapses that connect these signals to the brain, but that obviously takes more time and has a different function. The spindle reflex arc is rather like a miniature nervous system; a brainless one or one where the brain is only later informed.

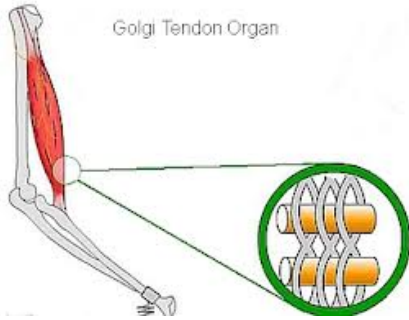
The skeletal muscles and the intrafusal fibers or muscle spindles are interwoven in the muscles. The motor neurons that stimulate these two muscle systems are separate. The skeletal motor neurons (*alpha* motor neurons) have their own paths through the spinal cord ending in the motor cortex near the summit of the brain. The intrafusal motor neurons (*gamma* motor neurons) take their own discrete pathways up the spinal cord and end in collections of cell bodies (*ganglia*) deep in the brain, in the brain stem. Thus, there are two separate motor systems within us. The *alpha*—which is associated with the cortex and is associated with conscious sensations in the sensory cortex—operates the skeletal muscles and is responsive to conscious motor commands. The *gamma*—which is associated with the older part of the brain—has no direct conscious sensations and functions primarily beneath the levels of conscious awareness.

However, these two separate systems are joined at their peripheries by the annulospiral receptors that wrap the fibers of intrafusal spindles and synapse in the spinal column with their alpha partner motor nerve for the associated skeletal muscles. Thus, any impulse and movement initiated by one system necessarily triggers an immediate reciprocal impulse and movement in the other, since the annulospiral receptor is stretched or compressed in either case. The alpha muscle system seems to dominate, to do the work of moving body parts, with the gamma systems, smaller and buried amongst the skeletal muscles, seems to offer a monitoring or feedback role. However, closer consideration reveals more, much more. The importance of the gamma system is hinted at by the fact that fully a third of the motor neurons in the human body are gamma suggesting that these participate extensively in coordination dynamics.

I'll come back to this system and I also need to describe other types of proprioceptors, but I want to make a brief statement about how these parallel systems impact the efforts to explain consciousness. In my reading, admittedly far from exhaustive, it is common to assume that we are either conscious or not, that consciousness is a given state that can have a clear and distinct explanation. Yet, in my personal experience I believe that a quality of almost everything I do is a felt blurring between what is conscious and what is not. I am conscious of writing these words, but not at all aware of which fingers are touching which keys to form these words. If I direct my consciousness to the keys and fingers, I'm likely to lose my sense of what I want to write. It seems that I can understand this blur in terms of

these two embedded neuromuscular systems. One operates on the conscious/unconscious continuum more to the conscious end of a spectrum while the other operates more to the unconscious end, yet because there are reentrant looping internuncial connections all along the process, I have varying degrees of awareness related to different aspects of a single broad action. Consciousness is a continuum, not something either present or absent. It would seem it would have to be a continuum rather than an exclusive presence or absence. Otherwise it would seem to be impossible to access the content of anything we'd designate as unconscious. I haven't found this consciousness as continuum idea presented, yet I believe it fundamental to understanding something we'd call consciousness, should we be interested.

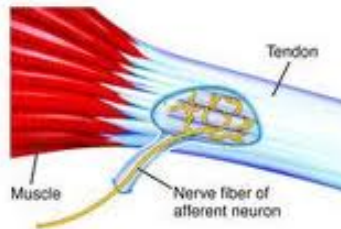
The other major type of proprioceptor, the Golgi Tendon Organ (GTO)¹¹⁴ comprises



another sensory system occurring in large numbers among the collagen bundles of the tendons and they serve as minute gauges of the efforts of the alpha muscle fibers. The GTO fibers in the collagen are zigzag shaped offering a small degree of elasticity in the tendon as the muscle is stretched. The GTOs are multi-branched nerve endings woven among the zigzagging collagen fibers. The GTOs are highly specific and reflect the activity of only 10 to 15 fibers in the skeletal muscles. The GTOs carry information to the ganglia of the brain stem,

with a few direct connections to the conscious cortical areas. Most of the information from the GTOs is processed largely unconsciously in the brain stem.

The annulospiral receptors and the GTOs sense different aspects of movement yet are closely paired functionally. Where the annulospiral receptors measure the changing *length* of the muscle fiber and the *speed* with which the length changes, the GTOs measure the *tensions* that are developing as a result of the changing lengths. The degree of distortion in the parallel zigzags of the collagen bundles is a precise gauge of the *force* with which the muscle is pulling on the bone to which it is attached. If these two types of proprioceptors seem redundant their differences are important allowing, for example, the same degree of movement of an arm lifting either a book or a feather the same distance and at the same speed. The GTOs assess the exact amount of *resistance* that is overcome in order to contract a given distance in a given time.



¹¹⁴ History of discovery of GTO ...????

GTOs and annulospirals working together measure the pure mass of an object (what Condillac referred to as “solidity”), that is, the measure of the object’s resistance during the encounter with the moving body. Importantly we can have no idea of the value of mass until we are actively engaged in moving the object or connecting with it through movement-touch. This is truly important I think when we begin to attempt to understand how proprioceptors assist us in creating and accumulating knowledge of the world, even sophisticated concepts and principles of reason. Proprioception offers direct knowledge of the mass and movement qualities of what we encounter through groping movement, gesture, and intentional movements. Profiles and histories of proprioceptive experience then correspond with, indeed construct, intricate knowledge of the environment as well as of the body itself. And we can begin to see that we cannot even know ourselves as moving bodies apart from the combined experience gained through the proprioceptors as we physically encounter our bodies in connection with the world through moving.

Like the annulospiral receptor axons that synapse with the motor neurons of the skeletal muscles in the spinal cord, so too do the GTO axons. However, they perform complementary functions. The annulospiral receptors have an *excitatory* effect on the alpha motor nerves, while the GTOs have an *inhibitory* effect on the alpha motor nerves. The annulospirals initiate movement and the GTOs inhibit movement in part to prevent the tear of muscle fibers or ligaments, but certainly also to adjust the flow of movement to the precise demands of the task at hand. These two types of proprioceptors act together to coordinate tension with one another. Together they constitute tone (sometimes appearing in its Latin form *tonus*) and this tensional oscillatory relationship will be increasingly important as I discuss the coordination dynamics of the whole animate organism.

As I will discuss later (see Coherence chapter) it is the performance and experience of smooth movement that I believe is the baseline for what we experience as coherence, a notion I believe often preferable to meaning. Thus, coherence is, at least in part, a proprioceptive phenomenon.

What observations might be made about this very general introduction to proprioception? Certainly, we can’t help but be amazed (the mystery has become magic) at the nearly incomprehensible complexity of a system that is fundamental to our existence as animate organisms. Proprioception is the conjunction of the nervous system and the musculoskeletal system and it is inseparable from living movement. Yet, by proprioceptors being the interconnection between the afferent and efferent, nervous and musculoskeletal systems, they are also at the heart of the connection between a person and the environment, self and other, person and condition, self-awareness. Proprioception is the inner touch that allows us to transcend the skin-encased physical boundaries of our bodies and to “feel” what it is like to do so. The feelings associated with this proprioceptively active moving/touching are inseparable from perceiving and knowing. Perceiving and knowing, as Condillac and Main de Biran understood and many others since, are inseparable from self-moving. Proprioception is at the nexus of the nervous system and the muscular system, as well as the interdependence of moving with feeling, perceiving, and knowing. Through the conjunction of movement and touch, proprioception connects us with our worlds and ourselves. In their powers of transcendence proprioceptors give a

corporeal basis for that Massumi described as “an incorporeal dimension *of the body*. Of it, but not it. Real, material, but incorporeal.”

With regard to movement, proprioception does many things: it refines the physical movements during the progress of movement based on environmental connections. This is no small point in that proprioception functions as a system dynamic, a self-adjusting system based on the constant self-monitoring within the system, to accomplish smooth movement. It provides sensation of movement to both the old parts of the brain and to the sensorimotor cortex. The experience of movement accumulates as neuron patterns as gesture, posture, skillsets, and engrams. Proprioception is at once the monitor for the nervous system regarding the behavior of muscles as well as an active force in the refinement and control of skeletal muscle movement. Without proprioception we would lurch and rip about in fits and starts like zombies, if we could move at all. Being comprised of systems that constantly connect across a gradient of conscious and unconscious aspects of movement, proprioception invades the conscious/unconscious borderland of our lives. While we may consciously direct our movement and action, the actual effecting of what is consciously directed would be impossible without the proprioceptive functions. For example, in playing a musical instrument or a sport, we consciously direct our efforts, yet we are also aware that this conscious direction is conjoined by unfathomable less conscious actions that parallel and comprise the whole, but that we cannot (thankfully need not) consciously control each and every one. The mastery of a skill is often marked by the shift away from consciously directing micromovements. The same process pertains as we acquire language, culture, personality, and the various arenas of acumen that give us identity and distinction. Still, all these skills are felt and experienced.

Proprioception is what turns what otherwise would be mere biomechanical movement into living movement. Proprioception is an essential dimension of cumulative experience and the development that occurs in the repetitious performance of living as a skilled and skill-building process. I want to make much of this later. Proprioceptors provide information that shapes synaptic criteria and what we often term motor or muscle memory. And as distinctive to living movement proprioception is inseparable from feeling; the ease and efficiency of the movement monitored and effected by proprioceptors are experienced as qualities of feeling.¹¹⁵ Proprioceptors are conditioned by the development of sensorimotor patterns in the acquisition of skill, gesture, habit, engram, posture, and tonus (all to be considered in fuller detail later) functioning as the foundation for that general sense of coherence.

Moving/Touching: Proprioception as Copresent Implication

I first became aware of proprioception in the context of simple physiology where it is typically presented as a feedback system that assists in preventing injury to muscles and

¹¹⁵ This feeling of moving is truly amazing to me. I think of so many things related. There is the sense of pleasure in skilled movement even if it causes bodily pain; think of sport and dancing. There is the sense of pleasure in newfound movement; consider how quickly toddlers go from unconfident steps to confident runners; toddlers and young children tend to run everywhere they go seemingly just for the absolute pleasure of it.

ligaments, to maintain balance (the aging often learn about proprioception, connected with the vestibular system, as they find balance increasingly difficult), and, in a bit broader terms as support for the kinesthetic sense (the term used often to refer to the whole proprioceptive system as a sense) helping us know the location of our moving body parts when we cannot see them.¹¹⁶ As interesting as are these common connections with proprioception, I immediately sensed that proprioception has profound potential even extending to philosophy when explored in greater depth. At the core of this profundity is the recognition that it is arbitrary or in service to functional interests whether one considers proprioceptors (especially annulospirals) as either muscular or neurological. The muscle spindle is actually a bundle of muscle fibers that resides within and functions in parallel with skeletal muscles, yet it does not do the hefty work of moving the body directly. These muscle spindles are wrapped with nerve fibers that sense the actual dynamics of the moving muscles in the spindle. One can isolate these two aspects, yet at the cost of proprioception itself. It is in the literal twinings of the muscle fibers and nerve endings that the annulospiral receptors are constituted. Furthermore, proprioception as inner touch or the inner assessment of the physical contact with an object through the dynamics of movement conjoins moving and touching. In both these respects perception in the most fundamental sense is copresence, a nexus across several axes.

Addressing this aspect Brian Massumi writes, proprioception

folds tactility into the body, enveloping the skin's contact with the external world in a dimension of medium depth: between epidermis and viscera. The muscles and ligaments register as conditions of movement what the skin internalizes as qualities: the hardness of the floor underfoot as one looks into a mirror becomes a resistance enabling station and movement; the softness of a cat's fur becomes a lubricant for the motion of the hand.¹¹⁷

We perceive the world proprioceptively when our moving body comes into physical contact with the world; the qualities and distinctive characteristics of the objects encountered are registered in terms of the muscular response proprioceived in the encounter. Sheets-Johnstone, Lakoff and Johnson, and others argue that this proprioception (although they don't use this word or consider the neurobiological details)

¹¹⁶ A large portion of the well-known studies of Ian Waterman focuses on this body-locational aspect of proprioception. Cite Gallagher and others. I have limited my use of the term kinesthetic to this sense of practical aspects of body movement—location, effort, and so forth. The term is often used to distinguish a style of learning as one being involved with movement and bodily activity; learning by doing rather than by being told what to do. Since my emerging position is that all learning/knowing is ultimately grounded in moving/touching then the sense that it is even possible to learn in the complete absence of moving/touching would be unfounded. There are interesting implications for a critique of this distinction between kinesthetic learning and intellectual learning. And, of course, these cultural and historical associations with the term kinesthetic tend to reinforce the mind/brain distinction from body. The issue with the use of the term for me is its history of usage.

¹¹⁷ Massumi, *Parables*, 58-9

of the world provides the genesis of our most fundamental concepts and knowledge; concepts not limited to the orientational concepts acquired early in life, but continuing in the ongoing process throughout life.

Massumi also writes “Proprioception translates exertions and ease of the body’s encounters with objects into a muscular memory of relationality. This is the cumulative memory of skill, habit, posture.”¹¹⁸

Not only does proprioception assume the conjunction of muscle and nervous system, it also assumes the continuity, despite the distinction, between exteroception and interoception, that is, touching/contact on the outside and touch via proprioceptive sensation on the inside. We feel movement and resistance to touch in our proprioception connected with movement. Emotions and feelings, and certainly the feeling we have related to knowing, arise from self-movement/proprioception.¹¹⁹ This insight regarding proprioception demands that we discontinue the nonsense of dismissing feelings and emotions as being of any importance to who we are and what we know.

Conjoining with the other senses Massumi writes that proprioception “draws out the subject’s reactions to the qualities of the objects it perceives through all five senses, bringing them into the motor realm of externalizable responses.”¹²⁰ Proprioception is an essential aspect of self-movement, is foundational to all of the senses and has a synesthetic function.

Proprioception includes feeling of the qualities of a moving kind of knowing that is not yet backfilled or territorialized which is why it cannot easily be described even on reflection in terms other than the vague references to terms like “rightness” or “pleasure” or “flow” or “smooth.” Yet, as I will show in a fuller discussion of the smooth movement in the chapter “Coherence,” even this difficulty can be discussed in some biological detail with success in grounding it beyond platitude. Proprioception is sensation and movement, monitor and initiator, exciter and inhibitor, muscle and nerve, conscious and unconscious, inside and outside, self and other, reflexive and directed, creative and traditional, inquiry and skill, habit and innovator. Proprioception, the conflux of self-moving and inner touching, is the seat of pervasive and foundational copresence, of vitality.

As we come to appreciate the architecture of proprioception, we begin to realize its complexity and importance. Against the background of the consideration of neuron/synapse, it is apparent that proprioception must be copresent with neuron/synapse for the nervous system to work. Although I avoid discussion in these terms because I know that the slightest invocation tends to result in domination, proprioception nullifies even the viability of distinguishing body and mind as anything

¹¹⁸ Massumi, *Parables*, ??

¹¹⁹ This understanding of the core of emotion stands, in part, in contrast with Lisa Feldman Barrett’s *How Emotions are Made: The Secret Life of the Brain* (2017). As obvious from her subtitle, Barrett locates the origin of emotion in the brain, yet she frequently indicates that the brain is informed by feelings in the body although she does not describe or account for how these feelings occur or how they are communicated to the brain.

¹²⁰ Massumi, *Parables*, ???

other than artificial or usefully analytical. Moving as it is in process, in movement, is the subject of proprioception and the result is a major area of coordination dynamics that involves not just the nervous system, but also the musculoskeletal systems. The effect is smooth and accurate movement even fine motor skills, posture, gesture and the coherence that seems the most common effect of all self-movement. Proprioception is a qualitative feeling kind of knowing that registers our relationships and encounters with our own body mechanics and with the objects in the world in terms of movement/touch qualities. In proprioception moving and touching are copresent, twined, separable yet inseparable. Finally, the form and function of proprioceptors are so intricate, so unexpected, so delicate yet fundamentally powerful, that they too must be understood as beautiful.

4 Body

We have been exploring within the body's hidden nooks and crannies examining those bits of us that are not much, if at all, in our awareness despite them being the foundations of our lives. They—neurons, synapses, annulospirals, Golgi Tendon Organs—are so integrated into vital processes and so numerous with such amazingly complex functioning attributes that we simply don't (can't) even consider them with any sense of mastery; they are of our nature as animate organisms. I suppose this is simply the way we all live out most every aspect of our lives; we have little sense of the essential details on which our lives depend. We have cars and know they have engines and tires and all the shiny parts that we find so attractive, but we know little more than that about what makes them go. We now have scores of electronic digital information and communication devices, yet most of us haven't a clue what makes them work. Can anyone comprehend what occurs during those few milliseconds when we do a simple Google search? Our neurobiology is even more complex, complexity on a completely different order.

Notably we have found parallels and echoes and fractals in the several architectures we have so far considered. Self-moving¹²¹ is primary to each concern shaping both design and function. The most fundamental comprehension of moving as it is moving is articulated as copresence by both philosophy and biology. While moving is never "in" any place, it still must implicate a "there that is here, but at a distance," a twining of what cannot be copresent yet is. The pervasiveness of this structurality¹²² is a core idea.

Self-movement is movement that we activate and direct and experience as "*my* movement" and it is inseparable from our personal sense of awareness, power, affect, and agency. Self-movement is, as Sheets-Johnstone revealed, our means of creating and discovering our identity (both the quotidian mechanical structure of our human bodies and also our personal cultural identity) as well as that of the world in which we live (both the physical environment and the social and even ideological and conceptual reality). But more than that, self-moving is the presence of our vital force. We don't exist in life without self-moving; we are animate organisms.

The aspects of existence revealed in our attempts at a radical consideration of movement are fundamental. Recall that, understood radically, self-movement simply cannot be confined to a body. Moving is always a body moving in context; there must always be an

¹²¹ There is certainly a curious issue that should be considered at some point. Self-movement suggests movement with intention, yet clearly we have included much more than movement with any conscious intention. I suppose perhaps we might simply be clearer and suggest that we are referring to movement in which proprioception is active, in other words, we are referring to movement where proprioceptors are sending signals to the cord and to the brain with the return signals that initiate skeletal muscle responses that result in movement. What we want to distinguish is movement that is more or less passive, as in riding through an environment on a cart, from active movement that involves the use of muscles, proprioception, and sensorimotor functions.

¹²² The term "structurality" is one I borrowed from Derrida. It dominated my discussion of dancing in DCR, less so now with my use of the term "copresent implication."

other. The copresence present as movement as the twining of self and other, of body and environment, is essential. Otherness is ontologically fundamental; there isn't some sequential causal relationship between self, other, movement; they come into being together as inseparable/separable twines.

The otherness of the environment must be understood radically as well I think. It is not that we somehow "know" the other because vitality is dependent upon it; it is in the very alienness of the other, that movement can move. Yet it is the negativity of other (as Barbaras understands it), the not knowing, the alien that fuels/energizes/gives the quality Barbaras refers to as "desire" to the very qualities of relationship that we describe as moving.

Following this twining, perceiving and knowing are facets of movement, of self-moving, as well. I'll explore these in more detail in another chapter, but it must be clear here that perceiving and knowing are faces of the skillful afferent/efferent moving/touching based architecture of the body in its environment.

Architecture of Body

To retain some parity with the analyses I have done before, I want to look at the body as a whole, sealed in a skin sack as the neuron is sealed in a cell membrane; that is as a whole organism, a living entity. Like the glial cell membrane, the skin is a defining boundary and perimeter to the body, yet it is also both porous and permeable. And, like the neuron, with its axon branches and dendrites reaching out to touch and be touched, the human body has not only limbs and hands and fingers and opposable thumbs and feet designed to support upright bipedal walking, but it also has organs of perception—eyes, ears, exteroceptors in the skin, noses, and tongues—that is, the traditional sensorium that actively reaches out to connect and to receive connection. Even the design of our appendages developed through evolution—such as having an opposing thumb and having feet and a spine design that enable bipedal upright walking—distinguishes us as humans among our animate kin. As we have found again and again, movement, particularly self-movement, is the force and medium of body connectivity with its environment and its whole self. The gap between us as individual bodies, implicating self and identity, must be crossed in some sense, for us to even have awareness of our surrounding world and certainly to interact with it.

Among our animate kin, the very morphology of our human bodies linked with our modes of motility distinguishes us in terms of the dynamic shaping of our idiosyncratic ways of connecting with what is not us. Our body design and modes of motility entwine with our distinctions as reachers¹²³ and gropers, as graspers and holders and keepers, as travelers and pursuers and seekers and explorers, as artists and musicians, as seers and visionaries, as spinners and dancers, as writers and technicians and makers. The distinctive morphology of the human body underlies the qualities and concepts that we consider

¹²³ See Thelen and Smith for the discussion of learning to reach as fundamental to all subsequent perceptual-motor learning, 247ff. Such movement correlates with the argument I make that smooth movement (initially experienced in learning to reach) establishes the basis or the control parameter for our comprehension of coherence (see Chapter ?? "Coherence").

characteristic of our species. Terms related to these human modes of movement that reflect body morphology are integrated throughout our most quotidian use of language. It must be understood that as our bodies have through the long journey of evolution been shaped by the history of their connection with their environment, so too the environment that we know and perceive is based and dependent on the morphology and motility of the evolved human body. As we comprehend the implications of the essential conjunction of body/environment (or self/other) for self-movement, we must comprehend that the shapes of both the body and the environment (other) are inseparable from modes of movement correlating with body morphology. The world and the body exist together inseparably, both shaped by the means and manner of self-movement.

I have some hesitancy in using the term “body” as the title and subject of this chapter. Because of the oppositional pairing of the word body with various terms such as mind, spirit, brain, soul, I am well aware that there is a gesturally naturalized response to invoke this oppositional pairing when any of these terms is mentioned. I stress that I want to resist these knee-jerk pairings. I stress that it is not that we “have” a body (as I have held, we are not *embodied*) but that we are self-moving bodies, animate organisms. My use of the term is in the most banal sense as the skin membrane enclosed self-moving organism; nothing more. And as movement is impossible apart from context/environment, the body is not embedded in an environment, but rather exists in terms of a copresence with environment.

Further, while the comments I made above related to body are focused on distinctively human bodies, I believe that the same dynamics of body pertain to all animate organisms and indeed that comparative studies could and typically are on the morphology and motility distinctive to each species and even to individuals within a species.

Five Senses

The sense organs are elements of human body morphology; we have eyes and ears, we have noses and tongues, as surely as we have arms and legs, fingers and toes. Furthermore, as we can trace the afferent/efferent neuron/synapse and proprioceptive loopings that interconnect the nervous and musculoskeletal systems with movement and touching, we must recognize that the sense organs (eyes, nose, ears, tongue) all have bundled afferent pathways to the brain and some sense of localization of processing within the brain and more broadly in the nervous system. We may also recognize that exteroceptors found in the skin, while spread across the whole skin surface, must function in a similar way, given that skin is an organ as well. What is perhaps more interesting, while less obvious and more difficult to comprehend, is how self-moving is fundamental to all perception. The fuller treatment of the fundamental role of self-movement in all perception must await fuller development in another chapter.

The key point here is that sensory organs are distinctive features of body morphology, no matter the species of animate organism. The senses then serve both to connect us humans with our animate kin and also to allow us to comprehend why we find ourselves often feeling like we differ from most of the others. At this point we must take on a new, much richer, understanding of the human senses. No longer can we simply see each of the senses as some sort of intake device instrumentally and objectively recording the world “out

there” in order that it be available “in here” in our brains as representations.¹²⁴ As I think of the architecture of human perception against the background of the other biological architectures I have charted, I have to recognize the fractal repetition of a structurality based on self-movement and touching. All of the senses then are both independent—indeed, notably vision, taste, hearing, and smell all have distinctive and separate biological systems—and inseparable from and interdependent with self-movement and touching whose neurobiology is ubiquitous. This interdependence, this synesthesia (though not the sensory condition formally labeled by this term), is fundamental to the other four senses. Most studies of “the senses” focus on one sense or serially on one sense at a time.¹²⁵ Historically in these studies, vision has been the exemplary human sense, the model for all other senses and, in fact, the model for human distinctiveness. Vision still retains this privileged position in the majority of studies. As I’ll consider in some detail in another chapter, while sight/vision are commonly focal, even exclusive, in discussions of perception and cognition, this vision bias is, I believe, often deeply misleading. While I recognize that the naturalization of this bias makes the use of language unaffected by a visual bias nearly impossible (what an *insight!*), I find that to focus (oh crap!) on self-movement greatly changes the whole scene (ouch!).

Sensorium

I had my first experience of a 4-D movie when I took my granddaughter to a movie; thankfully the title now forgotten. Along with the 3-D glasses, we got a card with a couple rows of stars on it with numbers in the middle of each star. During the movie when we saw a star flashing in the corner of the screen with a number in it we vigorously scratched and sniffed the corresponding number on our little star card. Frankly to me they all smelled mostly like the card itself. I couldn’t discern much difference among the scratch-released smells; the movie was sort of stupid anyway. This experience perhaps tells us something about our senses and that they have a ranking in importance.

Try to imagine a different world. One in which the most important and privileged sensory experience would be smell with sound second and vision only a distant third. Imagining

¹²⁴ I’m aware that many philosophers and cognitive scientists continue to argue about the representational and computational theories of perception and cognition. Predictably, I suppose, I find that these discussions are often framed to support the positions favored by the authors. For my part, although I’m keeping it in a footnote so as to not draw much attention to it, I can’t imagine that representation does not happen in some respects and that these representations reside somewhere in the chaos of my biology. I do have memories and images and ideas and recollections. Yet, I can’t imagine how anyone could consider any of these as somehow exact replicas of something external. I’m a tiny thing compared to the world I sense and there is very little similar between my memories and movies or photo albums. I’m just stunned that there is such an issue and can only think that it is a product of our style of groping and grasping, a style heavily influenced by the mechanical reproduction that makes replications and representations among our most common experiences. This gestural connection with the world was not always in these terms.

¹²⁵ Michel Serres, ??? is an important exception.

now a parallel experience in this world to the 4-D movie, it might go something like this. We'd go spend our \$20 and find a seat maybe in little plastic bubbles. It would be dark in there and we'd be all sealed up. Accompanied by the sounds of music or talking or the environment, we'd be bathed in mists of the various scents. Maybe the scents would tell stories or create journeys through emotional smellscapes.¹²⁶ Rather than being called movies they would be called "smellies." I suppose we might have smellie-chambers in our homes where we could experience home smellies. Our technologies would be highly developed to recreate the smell of anything and our noses might grow larger and larger over time as we dilated them to take in more scents. Our language would develop extensively to create a rich vocabulary related to smells, quite in contrast with our current vocabulary that does little more than to indicate, "smells like" We might have features on our handhelds that would capture selfie-smellies that we might exchange with our friends.

Then one day along would come an innovation, 3-D smellies. The smelliebubbles would be equipped with a monitor that would add vision. Now as we listened and smelled our way through the story or experience, we'd also see the scape of smells. Likely we'd consider this innovation a novel experience, yet we might ask whether it would be really worth the extra \$5 we have to pay for the visuals. Some might complain that what we see on a two-dimensional small screen doesn't replicate at all adequately what we experience through smell or vision in "real life." Smells are strongly connected with memory and recall and these connections might be muted, even violated, by the presence of some apparently objectivist visuals.

In theory at least, there isn't any reason why we might not have a sensory hierarchy that would place smell as the most important sense followed by sound with sight a distant third. Think of Helen Keller born unable to see or hear, yet she was able to live a rich and full life, lecturing, writing books, and offering amazing insight (hmm!) into our perceptual natures. Of course, the Keller example offers support of my most basic proposition since she said that touch was for her essential; that she couldn't imagine any existence without touch.

The sensorium, our composite of sensory channels, is not simply comprised of five separate ways of taking in information from the outside. Rather, the various distinguishable senses comprise a complex interwoven organic system. The sensorium of a specific person or culture or historical period is typically arranged in a hierarchy of the five senses. Some cultures even divide the senses differently than this standard five. The hierarchy among the various senses is not fully determined by biology; it is broadly influenced by culture and history and psychology (and bodily abilities and skills).

Walter Ong's 1982 work *Orality and Literacy* plumbs the depths of influence on the shape of the world and our experience by the means we use to communicate. Human life, he showed, is experienced quite differently by those who are predominantly oral and do not use writing, compared to those whose world is shaped by writing. We are, in important senses, shaped by our technologies of communicating; technology is the prosthesis of our gestural constitution. Although Ong wrote before the most recent deluge of technological

¹²⁶ Reference that article that describes the smells associated with various locations ... can't recall where it is published.

developments—the Internet (the World Wide Web began in the late 1980s) and the electronic digital age—he foresaw them and the deep impact that they would have on us and on our worlds.

Ong was also interested in the senses and perception. He made simple terminological shifts to remind us of our usually unacknowledged leanings. For example, he coined the term “worldsense” to replace the word “worldview” knowing, I suspect, that it would shock us by its unfamiliarity and force us to open ourselves to the possibility that our world is constructed and known by all of our senses rather than simply by our faculty for sight. Such a simple strategy also suggested that we have a hierarchy among our senses that correlates with our deepest values.

The term *sensorium*, as Ong explained, designates the entire sensory apparatus as an operational complex. This includes the articulation of the senses that comprise the apparatus, how these relate, how these are valued especially in relationship to one another. Ong suggested that, while it would not be a simple endeavor, to account for the sensorium of a culture would be a fitting way of understanding that culture. The development of sensory anthropology under the direction of David Howes and Constance Classen¹²⁷ has demonstrated the potential of this approach. Supported primarily with anecdotal information, Ong argued that there are cultural, historical, religious, psychological markers associated with senses and sensory experience. Thus, without denying the biological foundations for articulating and understanding specific senses, one can develop accounts of sensoria that entail the connections of sensory experience to culture, history, religion, and so forth.

Now there are deeper considerations to be made a bit later about the way the whole perceptual system works, but I’ll focus here on the sensorium.

Ong reminds us of the common knowledge of how essential is touching for the groping infant. I have a toddler granddaughter and I have had the pleasure of watching her grope her environment. At first I couldn’t seem to get her to even look at me, but she’d reach out and she seemed delighted by touching and grabbing onto me. A bit later she became more obviously visual so that she looked at me with an intensity that suggested she saw me as some sort of alien species she has taken an interest in studying. And she also began to vocalize much more. It is easy to see that she was exploring making different sounds and to discern the responses she got to them; the predecessor to speech. Ong reminds us that even throughout the life cycle, the sensorium changes. It begins with touch obviously enabled by proprioceptively active movement, then sight and sound and so on. Of course, taste is in there pretty early yet even taste is strongly interconnected with touching, isn’t it; and, of course, with smell?

Ong also reminds us that the historical shift from orality to literacy was a shift from an aurally dominated sensorium to a vision dominated one. Ong sees that the development of technologies—he mentions radio and television—impact our sensory hierarchy. We need to think about how rapidly we are becoming the cyborgs that Donna Haraway predicted a

¹²⁷ Reference some of their work and mention Paul Stoller and others perhaps.

quarter century ago and how the senses of electronics are supplementing our own.¹²⁸ We are rapidly embracing wearable computing devices. For many Siri is one of the few “people” with whom we still actually speak.

Ong also reminds what most of us have experienced firsthand when we travel, that different cultures have different values often associated with different senses and sensory hierarchies. Some cultures consider touching another person to be highly rude while others feel that without physically touching one would be rude or cold.¹²⁹ Once we begin to appreciate the cultural differences in the sensorium then we begin to appreciate how extensive and remarkably insightful are these differences to the understanding of culture, its plasticity, its variations. As mentioned, the field of sensory anthropology emerged in the last quarter of the twentieth century contributing hundreds of fascinating studies documenting these cultural distinctions.

Under the topic “know thyself,” we can reflect on our own sensorium. Clearly sight and sound, seeing and hearing, typically top our sensory hierarchy. Why? Because sight correlates with many things we most value: written word, considering the world as objects, the identity of sight with reason. Seeing documents truth as in the importance of the eyewitness in a court of law, even though it is well established that eyewitness testimony is among the least reliable measures of veracity. We often say, “I have to see it to believe it.” Or, “It is true, I saw it with my own eyes.” Seeing is used metaphorically to designate awareness. The common term “insight” shows that we don’t even think specifically of vision when we use such a term, yet it clearly (also associated with vision) articulates and effects the high value vision has among our senses. We don’t refer to our “intaste” or our “insmell,” but others might.

Note how squishy we consider a statement like “I have a feeling about that.” “I’m getting a feel for it.” Such terms often suggest vagueness and inarticulateness; a suspiciousness regarding feeling even though if I cut my finger the truth of the pain I feel is pretty uncontestable. But even pain seems subjective, perhaps because it is itself invisible and we have not developed an adequate language of pain. We don’t hurt when another person suffers pain. The very language of pain, as Elaine Scarry¹³⁰ shows, is vague. We use numbers to try to make up for it, “On a scale of 1 to 10, how much does it hurt?” More recently we have begun to use emoticons. “Which of these faces show how much it hurts?” How remarkable that something as common as pain has such a limited vocabulary.

Once we move past vision and hearing, the other senses are, from the cultural perspective most of us in western cultures share, identified as the “animal senses.” Of course, this also says something about how we understand ourselves compared with animals because most animals either see or hear, often both, far superior to us humans, but they don’t read and write. We think of animal in terms like brute, grossly physical, and not mental or intellectual. Their senses are touch, taste, and smell. Sometimes we refer to these senses

¹²⁸ Haraway, “A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century” in *Socialist Review* (1985). See also my extended discussion of cyborgs and metahumans in “Into the Future: ...”

¹²⁹ E. T. Hall’s work *The Hidden Dimension* () is a valuable resource.

¹³⁰ Elaine Scarry, *Body in Pain* ???

as the “lower senses,” sometimes as the “animal senses.” How interesting, since taste and smell are as head-centered as are sight and sound. They are lower only in the sense of being of lesser value. Ong refers to these three senses as the “proximity senses” while sight and hearing are considered the “abstract senses.” This terminology correlates with the body/mind separation that has been so fundamental to our specific cultural history.

And notice that along about here we begin to gain some sort of important insight (that word again!) that the sensory hierarchy, as a set of cultural values (abstract ideas), plays a determining role in the way we actually sense the world, in how the world is shaped by our own means and style of perceiving it. How could it be otherwise? What begins to dawn on us (think about the vision base of this metaphor!) is that our biology is literally shaped by cultural, historical, personal, psychological experience as much as, or at least in strong conjunction with, our human biological architecture and bodily morphology and modes of motility. That is, it is not only that seeing is believing, but also that believing is seeing!

With this poetic trope, we should think of Merleau-Ponty’s discussion of “chiasm” as a way of comprehending copresent implication. And I can tell you now that this is a remarkable discovery and there no way that we will resolve this paradox; indeed, my objective is to come to appreciate that this paradoxical (or better chiasmic) dynamic is indeed what is so cool about who we are, have been, and will become. Add Section from Always Already disussing Chiasm passage pp. 90 ff here?

Comment [Office10]: Maybe drop this paragraph

Comment [S11]: ??

Touching and Moving

Touch has long been understood as somehow different or unusual among the five senses. Indeed, in the early nineteenth century (1820) French naturalist Jean-Baptiste de Lamarck excluded touch from his consideration of the standard senses preferring to consider it as more pervasive and as acting in a different way than the other senses. All four of the non-touch senses are, he noted, “executed in certain determinate parts of the body and nowhere else.”¹³¹ He understood touch to be a different kind of sensation—he called it “permanent sensation”—which he described as “that sensation which is executed in all the sensible parts of the body, in general and without discontinuity, during the entire course of the individual’s life. It results from the vital movements, the displacements of fluids, and the frictions brought about by these displacements, frictions which are the result of contacts and the result, therefore of affecting causes, . . . It is probably to this physical cause that we owe the intimate sentiment of existence which we feel, however obscure it may be.”¹³² The inquiry articulated as the Greek *aiethēsis*, the common sense, dating from antiquity had become by the end of the eighteenth century came to be referred to as *coenaesthesia*¹³³ and corresponded with what had begun to be understood as “inner touch.” Most notably Lamarck described the copresence of moving and touching and the identity of the feeling of touch as “the intimate sentiment of existence,” that is, with vitality. The touch/movement copresence is the feeling of our living existence.

¹³¹ Heller-Roazen, *Inner Touch*, 243, quoting Lamarck where?

¹³² Heller-Roazen, (H-R 244-5) quoting Lamarck ???

¹³³ First appearing in Christian Friedrich Hübner’s 1794 University of Halle doctoral dissertation titled *Coenaesthesia*. For more history and comment on the term see Daniel Heller-Roazen, *Inner Touch*, pp. 237-51.

One of the things I think we must take from this long history of inquiry into the sense of sensing is an understanding that touching and feeling have played various roles in the many considerations of perception and knowing. Touch has been considered as one among the five senses, but there is also a long precedent for touch being seen as something rather different in many respects from the other four senses. I don't see why, with a bit of explanation, we cannot understand touching in both ways at once, realizing that we'll need to engage in a bit of explanation and clarification. It seems quite possible to distinguish touch in, or as, at least two senses (literally) or even as two senses given that each is associated with separate sensory receptors; one operating/functioning in a manner rather parallel to the other four senses and the other referring to the "inner touching" proprioceptive feelings related to living movement.

Skin is the organ of touch, in the first sense. Exteroceptors in the skin stimulated by physical contact are present, if varying sensitive, wherever there is skin; the touch of the finger on velvet cloth, the touch of a lover's hand on one's face, the touch of the breeze on the cheek, the feel of the texture of the floor on the feet, the feel of sunshine on one's neck, the pain of a scraped knee. There are endless types of sensation that occur by means of sense receptors in the skin. Touch in this sense is easily distinguished as a sense both in terms of the organ of touch sense as well as the kinds of sensations described as touch as varying as these are. In this sense touch differs from other senses in terms of the diffusion throughout the body of the neurological routing. Even touch based in skin sensation is invariably connected with moving and thus also with proprioception. While some touch sensations such as heat are active without movement, most require some physical movement to activate the contact between the touch sensors and the objects sensed. Putting a finger on velvet does little to activate the touch sensors, whereas moving the finger across the surface of velvet does activate the sensors. This suggests that touch sensors function in a kind of comparative mode; that is, it is the comparative evaluation of the micro-changes over time that occur in a field of touch sensors that comprise the overall touch sensation of an object encountered. This micro-comparative aspect of touch is worthy of further consideration.

Because proprioceptors are located not in the skin, but in the muscles, ligaments, and joints, this "inner touch" can be physically separated as a distinct sense in terms of strictly biological facts. In quotidian terms these two senses might simply be termed touch¹³⁴ and proprioception or kinesthesia, bringing the sensorium to six rather than five. This is sometimes done.

While touch and proprioception are most commonly considered completely separate from one another, it is essential here to remember that, as discussed above, once we understand the copresence of moving and touching, the two touch senses can hardly be separated. Each implicates the other and it would be a considerable challenge to effectively completely isolate either. Although he did not articulate it in terms that reflect an awareness of

¹³⁴ Diane Ackerman, *A Natural History of the Senses* and Constance Classen, *The Book of Touch*, among others demonstrate how remarkably rich and complex is touch. Seems there are endless aspects of touch, all fascinating, as are the implications of touch on the shape and texture of our living experience.

proprioception, Maurice Merleau-Ponty's most fundamental example on which he developed his "flesh ontology," his theories of ontology and perception, was one hand touching the other in which he noted that there is a reversibility or in his terms a "copresent implication" of touch on the surface and as sensed within the body. He described this "reversibility" (which here would be the necessary connection between exteroception and proprioception), as he called it, in terms of a glove being turned inside out and back. Surely also his choice of the term "flesh" reflects this same necessary interconnection since the word flesh can indicate either skin or meat (muscle). I'll consider Merleau-Ponty again later.

Important here is that as we begin to understand that touch in both the senses of exteroception and proprioception co-implicate one another, their twining is of the same type we have seen as being both exemplified and affected by moving. We can begin to glimpse why Merleau-Ponty would focus on "flesh" to attempt to articulate not only perception, but also, more importantly, what he understood to be "the ultimate truth."¹³⁵

Seeing and Hearing

The architectures of neuron/synapse, proprioceptor, and body as it engages the world, are all architectures of reaching to connect, to touch, but also to be touched, to be connected with; all these reachings/touchings are inseparable from movement, self-movement. The proposition then is that, while we typically consider the senses as a hierarchy of separate senses with sight as dominant and touch among the lowest and associated most commonly with our base animal natures, and movement not even included as a sense or involved in perception, we have come through this architecturally inspired philosophical biological approach to the proposition that movement/touching, themselves scarcely separable but better considered as alternate ways of considering the same thing, are fundamental not only as senses themselves, but also as foundational to perception and thus to all the senses. The challenge then is to surpass the given (inherited, received) understanding of the senses by comprehending how moving/touching are fundamental to all senses, to all perception.

There is a simple default position that sight, for example, involves the movement associated with light (waves or particles), striking/touching the rods and cones in the eyes, and the movement via neurotransmission of these impressions to the appropriate brain centers, yet this isn't what I have in mind to ground seeing in movement. There are also the constant micromovements of the eye called microsaccades, but these are not what I have in mind either. We also know that vision doesn't develop without self-movement, that is, without a touching (proprioceptive) kind of moving. This touch/movement connection is closer to what I have in mind, but not quite there yet. Then there is the sort of virtual seeing involved with palpation, that is, the active examination of something in the world by means of a groping exploring, yet skillfully so. Perhaps it is a grasping, touch with a prostheticized finger or hand producing virtual images of things unseeable by the eye. This too involves proprioceptively active touching/moving that produces something we often call a "visual impression," if a virtual one. It demonstrates that via gesture there is a synesthetic leap from touch/movement to vision. But this example, while provocative, is short in that it doesn't involve the eye in the perceptual experience. But, I believe it is very

¹³⁵ Merleau-Ponty, *Visible and Invisible*, 155.

close and requires only that we consider a different phase of the looping arc that constitutes vision involving the eye.

First, a bit on how vision is part of the gestural act of palpating and then on to orange violins. The skill required of palpating is won by not only practice but also by awareness and knowledge based on being able to see virtually inside the body. Yet, this knowledge is gained only through the action of dissection and invasive anatomical exploration. One must, for example, cut the body open and explore it to learn of its parts and functions; its healthy conditions and its pathologies. These are actions in which visual knowledge is won only with the gestural operations of surgical manipulation, touching and moving, usually assisted by mechanical or electronic magnification. The visual aspect of this knowledge may then be transmitted by drawings (themselves producible only by movement and touching; the earliest among these in the sixteenth century by ????) or other physical means such as photography, x-ray, and fMRI techniques. The visual aspect of palpating is in some sense the objective, the goal, of the gestural act—that is to gain a sense of the visual knowledge in virtual reality of what cannot be readily seen directly with the eye—and it can never be separated from the looping arcing process that allows visual knowledge (distinction and identification in this case of anatomical parts and their condition) to be gained only from moving/touching.

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What emerges here as important is that seeing, like gesture/posture (as gesture/posture) that I'll develop in another chapter, is an act of skill and experience; we must learn to see through looking practice; in this case, looking with the fingers. While we might posit that we can be simply passive of body and eye and yet see things in the world (this is our inherited quotidian understanding of vision), and of course I suppose that in limited ways we can, I maintain that we cannot *know* what we are seeing without the experience built up through proprioceptively active and repeated touching/moving. These repeated experiences accumulate as experience; I'll offer a fuller account of experience in these two senses below. I would argue that we can have no visual experience—that means we simply cannot see—of anything that we have not also acquired, in some way, an experiential base knowledge (the accumulating experiential foundations for neuronal groupings) gained in touch/movement connecting with visual stimulation. This position is to take radically the argument that perceiving is moving, moving perceiving; I'll argue this more fully in a following chapter. Seeing is an act of skill and experience and practice and, as such, simply is inseparable from self-moving. Seeing is perhaps above all an act of recognition; the biological coordination of sensation with accumulated experience that give content to sight. Understanding seeing this way allows us to appreciate that the touching/moving proprioceptive experience is biologically retained and available to the coordination processes that are constantly invoked and refined with our every visual experience. We recognize (see) more as we gain greater visual experience. We gain the visual knowledge (accumulating experience of the visual) by which to recognize, based on experience that is always ultimately grounded in touching/moving.

In simple experience in the sense of an immediate occurrence, when we encounter a visual impression of something (a sensation) that we do not recognize, I suggest that we are seeing only in a raw sense, that is, vision before it is a sensation of a seeing kind. This is perhaps the sort of sight experienced early on by babies. As adults, we have to learn to

“unsee,” if we even can, in order to comprehend this baby-seeing. This raw vision is also what characterizes the first visual experiences of the congenitally blind who have sight restored by surgical procedures. This sort of baby-seeing is without recognition of what is seen; it is seeing with little if any knowing, a seeing before seeing any *thing*; shifting blotches against the Ganzfeld. Indeed, the blind who have gained sight as adults often are simply overwhelmed with the task necessary to relearn their entire gestural life that would require the touching/moving experience of the world in order that their sight become knowing and recognizing, that is, seeing a world. We may comprehend this a bit more by considering those occasions when we visually encounter something that we do not immediately recognize or can relate to something we recognize. Typically, we will have the urge to attempt to touch it or to move it around or move around it in order to discern its edges, its mass, its texture, and so forth so that it might be compared with and placed within our visual knowledge already proprioceptively acquired. In the process it becomes something we actually see. Only then, after touch and movement, can it be seen in the sense of a thing visually known; an experience of recognition.

Tasting and Smelling

Years ago, I had a golden retriever named Khumbu. He was a beautiful friendly dog that never really stopped being a puppy. His sense of smell amazed me. I lived in the mountains then and I would take him to a high meadow near my house and throw a ball so he could enjoy the attribute distinctive of his breed. I often wondered if it would be possible to throw the ball enough times to finally wear him out. Never learned the answer to that. Often in the spring the grass would grow to a fair height up to his shoulder and when I'd throw the ball he'd run in the direction of my throw, but often the grass would keep him from being able to simply see where it went. He'd put his nose near the ground and run in a spiraling search pattern. Every once in a while, he'd stop pop up his head so he could see above the grass to look around until he spotted me and then go back to his sniffing search until he found the ball. He always did. As I think back on that I just can't quite comprehend the miracle of his smelling ability. He was able to find a ball not by seeing it but by smelling his own spit on it. Granted this smell was a bit rank, but I'd need to be within several inches of it to smell it and he could hone in on it from a distance of many feet.

As it is certainly clear by now in light of even a rough account of evolution, humans fascinate me. And here Khumbu plays a role. The rough development I have in mind is simply the shift from quadruped to biped. Khumbu, representing the quadrupeds, has his nose to the ground almost literally. The relative position of his nose to the ground is inseparable from his evolutionary shaping as a quadruped. Indeed, he could run quite rapidly with his nose almost touching the ground. I can't imagine myself being able to move at any speed with my nose to the ground and the image of even trying is the very definition of gracelessness. He could seemingly smell things underwater when we played in a stream. He literally stuck his nose in his food when he ate. It was unavoidable since his mouth was under his nose. It is beyond my imagination to grasp anything like his amazing sensitivity to smell. It is pretty clear that smell was a dominant sense for him. Indeed, even when he could see his objective, it was clear to me that he much preferred to rely on his

sense of smell. I doubt that Khumbu is unusual among many, if not most, quadrupeds in this respect.

As evolution eventually separated off one line of development that led to animals that stood on their back legs all these sensory values shifted in conjunction with that development or decline, I suppose which one is yet to be determined, that led to us human folks; the seeming crowning glory of bipedalism (that we consider a head ornament as the metaphor here may reflect our homocentric bias). Our noses and mouths are far from the ground where food grows, where food is prepared either raw or over a fire. No longer do we stick our mouths and noses into our food to eat, food must be delivered to our mouths with the accompanying smells wafting into our noses right above our mouths. We have hands with which to eat and the proliferation of eating and cooking utensils are all prosthetics that extend our hands in some way to serve the features of our evolution. A starker image is that as quadrupeds our mouths and teeth used to be our killing instruments and our procurement of food was a deathly intimate bloody affair. Once standing upright our killing instruments became hands and arms and the gestural prosthetic extension enabled by spears and clubs. There is a significant sensory shift in relation to food based on posture. Our human ability to smell and, most surely also, to taste have declined as well. Eating has become one of the core activities of the anterior region (that beach ball shaped protrusion from our chests) that seems a privileged arena accompanying bipedal evolution. Vision, hearing, and the micro-movements of the hands, especially the digits, have come to be the locus of our humanity. It is remarkable that while many anticipated that this seeming progression surely is the result of a greatly advancing brain evidenced by a larger skull, Andre Leroi-Gourhan and others discovered that the feet were what developed first allowing for upright posture and bipedal motility. So literally it seems that the feet have led to the construction of the modern human brain. Yet this is a subject, while of enormous interest and implication, I'll have to explore another time; and, besides, my preference is to believe that we evolved as integrated animate organisms with constituent parts simultaneously co-evolving. The distinctiveness of our feet, hands, and brains—obviously twined to function properly—evolved inseparable from habits of movement and posture.

I'm linking taste and smell together both for convenience (much of what I have to say of one I'd also simply say of the other) but also because taste and smell are synesthetically meshed. Like teenaged lovers, it is not that it isn't possible to separate them, but to do so is upsetting to them and probably isn't worth the effort.

The premise of this part of the study is that perception involving any of the senses is ultimately built on self-movement. And I have shown that it is not really possible to understand moving adequately without also invoking touching. Indeed, in many respects moving and touching are alternative or complementary terms/approaches to the same things: perception and knowing, vitality, life.

When we look at perception in terms of moving/touching, perception is characterized as experiencing a gap that both separates and connects perceiver and perceived, percipient and perceptible. This gap is never closed; indeed, so long as perception is in any sense a knowing, the gap cannot close. This gap connects, conjoins, as it separates and divides. This gap is how we conceived the twoness that is also a oneness that is the character of perception. We have understood perception as looping and networking (reticulating)

rather than linear and unidirectional. That perception is a skillful action as well as a reception; an expression as well as an interrogation. That perception is a creation while it is also a discovery. These seeming impossible pairings are the very heart of perception and indeed life.

With taste and smell as with the other senses, the challenge is to understand how these senses are formed in and serve this understanding of perception based on moving/touching and to see the advantages and added implications of doing so. Both of the words, taste and smell, can be used as a verb, meaning the directed action of tasting and smelling. These actions are something we can purposefully do. Although, as Diane Ackerman points out, we cannot effectively choose not to smell for long else we die since breathing is coincident with smelling. However, even smelling is something we can and often do elect to do and that is accomplished by placing our noses close to the object we desire to smell and rapidly inhaling with gusto and holding in the breath; I'm thinking of lilacs in the spring. Tasting requires putting something in our mouths or bringing our tongues in contact with the substance to be tasted. Both actions involve taking in what is normally out. To be done purposively requires the basic bodily concept of "in" (and therefore also "out") as well as "self" (and therefore also "other"). Indeed, these actions which begin in infancy, as directed by inborn sensorimotor programs, are inseparable from the very process by which, as Sheets-Johnstone argues, we establish such corporeal concepts as "in" and "self" even in the rudimentary sense that is yet attached to reflective awareness.

Tasting and smelling are multi-stage processes. Typically, after inhaling a scent or placing something in the mouth or on the tongue, we wait expecting a vague ensemblings (as I'll describe this concept in more detail in a following chapter) to occur that will begin to deliver potential identities and associations and values to the sensations we are experiencing. We have an awareness of a dose of raw sensation, could be a hint or a blast, and then we may have an awareness of processing that sensation to arrive at identification, implications, affects, reactions, triggered memories, and so forth. We may conclude rather quickly with "it is banana." Or we may continue on through extended memories of a love affair in Costa Rica that we had half a century ago somehow connected with the flavor/smell of banana. Or we may be motivated to quick action, as in spitting out something or rapidly exhaling, because the sensation is understood as connected with poison or something dangerous. We are well aware that both smell and taste are impacted by temperature and quantity and many other variables that do not change at all the actual composition of the object sensed. Importantly too, we are aware of our sensory processing of both smell and taste sensations and the processes they have initiated.

In the terms of the relationship of movement/touching to smell or to taste, in this understanding, to sense or to take in or to engage or to connect with, is to make what is other, that is not self, sensible to self, both in the implications of being perceivable and intelligible. Sensing is a skillful act of appropriating and converting what is alien and other to self and the familiar. What is other is made at once also self by ingesting it, taking it in and engaging it in the conversion process that is inseparable from perception; converting it in some respects into me, mine, my memory and history and knowledge. There are a number of stages involved that we can identify and have awareness of (we can perceive if

we choose) including evaluating raw sensation in terms of: 1) the biological/evolutionary experience that informs us of the propensity of poison or harm related to certain types of tastes and smells, 2) our distinctively personal experience ranging from single strong experiences to our acquired skill at tasting or smelling, 3) our cultural identity, 4) the interaction that the raw sensation has with other simultaneous or interactive sensory experiences (synesthesia), and 5) many other factors.

Wine tasting is an interesting example; even that we say “wine tasting” rather than “tasting wine” is fascinating. The entire ritualized process of tasting wine purposefully engages sight/color, physical behavior (legs on the glass), smell and how to get fullest access to the smell and taste including awareness of the areas of the tongue that are sensitive to various types of taste and time including the awareness that taste/smell evolves over time including the initial sensation followed by an evolving progress of sensation and dwindling away over a variable interval. Here the whole process of flavor/smell is understood in an analogy with appreciating music and is described in terms of notes played as the melody unfolds and lingers . . . or not. Then the tasting typically involves identifying taste sensations in terms of other items that have distinctive odors/tastes such as berry, fruit, earth, tobacco, leather, citrus, musk, and so on. Interestingly these are general classes of taste/smell and something too specific would most surely be a negative evaluation of wine in being not adequately subtle. For example, blueberry flavored wine would not be nearly so appealing as wine with a berry note. Sommeliers create stories of color and associations with things that depend on common synesthetic experiences to express the discriminations revealed by their discerning tastes. These sorts of associations also indicate the importance of expectation on experience; if a sommelier identifies a hint of citrus, our knowing this expert opinion increases the likeliness that we will taste it. The point really is that smelling/tasting is to make the *other* into the *self*, to process the raw sensation in terms of a complex network of biological, human, historical, cultural, and personal factors so as to at once appropriate the other as mine, as part of me, and at the same time to explore and discover the world beyond my physical limitations.

Understanding this sensory perceptual process of tasting/smelling we have to acknowledge that these are processes of valuation and identity and experience and agency and education and expression and life. These perceptual processes have so very little to do with just gaining objective or factual “information” about what is “out there” compared with the processes of appropriation and evaluation and action and relationship all based in experience. This view of taste/smell encourages us to recognize that these senses are based on the same structuralities that we identified as distinctive of moving/touching. Tasting/smelling are about the gap, the distinction between a source or object of taste and/or smell and the perceiver, and the processes of crossing that gap; to assimilate and appropriate raw sensation into value and identity and perhaps more importantly to the tapestry of triggered accumulated experience.

Taste and smell can be understood not only as verbs, as actions, but as nouns, as things. Of course, there are identifiable tastes and smells, but then there is the notion of taste itself. Taste in this sense designates a variety of possibilities from distinctiveness, as in “he has such strange taste in clothing,” to skill and refinement, as in “that wedding was so tastefully done.” Interestingly one can have taste in smells and in colors and in sounds, suggesting to

us that taste on the tongue is strongly connected with personal value and that taste is commonly experienced synesthetically.

Most studies of taste and smell identify particular cultural/historical examples or practices or contexts, yet it is essential to engage them in terms of this understanding of perception based on moving/touching in order that these examples be more than merely interesting.

The minimal position on understanding taste and smell in terms of movement and touch is that substances with the potential for taste and smell must be moved into the proximity of the tongue and nose and make contact with taste buds and olfactory organs. But this is not of particular interest to the approach I have been developing. Moving to a more interesting perspective is the experience we have of the valuation of taste and smell based on culture, age, and even history. We even use the word “taste” to refer to this sense of variation and that value is usually associated with one’s attraction or repulsion to taste. The etymology of the word “taste” is interesting. Historically the modern use of the word taste referring to sensation on the tongue is rooted in the word for “to touch, to handle.” The word is also used to indicate a trial or a sample. “Can I have a taste of that soup?” “I want to have a taste of climbing.”

Taste is often used broadly and synesthetically implying perception. In this use it designates a “block” or “synesthetic clump.” To say that one has good taste, can refer to a certain set of valuations related to a wide range of sensory distinctions. When we say that someone has good taste, we refer to much more than the sensation on the tongue. In the narrowest sense, we are all familiar with the synesthetic link between taste and smell in the context of food. If we have a cold or allergies that make it difficult to smell, we become aware of degradation in our ability to taste and to savor food. And then there is a group of related words including savor and flavor. Savor, in the verbal use I just made, means “taste, breathe in; appreciate, care for” and can refer to either taste or smell; more likely the combination. Flavor or savor as nouns originally referred to smell rather than taste, but they have come to refer perhaps more to taste, yet not inappropriately to smell or odor. Savor also refers to salt. The word salary has same root and we can see the history in a phrase like “worth your salt.”

What of course emerges from this bit of an introduction is that taste and smell are subject to being savored, that is actively breathed or otherwise taken in to one’s body. It is certainly common for taste and smell to be seemingly an incidental, that is, we can simply in passing notice a taste or smell. Yet, more consistent with the theory of perception being developed here as skilled action, we can actively taste and smell with intention and discernment. To savor we actively engage and assess flavor and odor. One cannot savor without a palette of sensory expectations that are born in accumulated experience. While olfaction may work mechanically so to speak with every intake of breath, it is only savoring or “smelling” or tasting when there are expectations, recognitions, discernments, and even a sense of increasing refinement. Diane Ackerman puts it this way. “Smells detonate softly in our memory like poignant land mines, hidden under the weedy mass of many years and

experiences. Hit a tripwire of smell, and memories explode all at once. A complex vision leaps out of the undergrowth."¹³⁶

Taste and smell have continuity with proprioception. Taste and smell are qualia of the proprioceptive exploration of the world and its accumulating experiential knowledge. As Ackerman puts it, "When we use words such as smoky, sulfurous, floral, fruity, sweet, we are describing smells in terms of other things (smoke, sulfur, flowers, fruit, sugar); things we have physically encountered through active proprioceptive touch. Smells are our dearest kin, but we cannot remember their names. Instead we tend to describe how they make us feel. Something smells 'disgusting,' 'intoxicating,' 'sickening,' 'pleasurable,' 'delightful,' 'pulse-revving,' 'hypnotic,' or 'revolting.'"¹³⁷ This continuity with proprioception is reflected in the language acts related to taste and smell. Almost all of the taste and smell terms refer either to the effect of taste or smell on the perceiver—bitter spicy offensive pungent sweet strong—or to the object with which taste and smell are qualia—orange sulfur rotten earthy tobacco citrus floral fruity musky and so on. "We taste only four flavors: sweet, sour, salt, and bitter. That means that everything else we call 'flavor' is really 'odor.'"¹³⁸ Unlike colors, tastes and smells do not have a very rich vocabulary of terms that are abstractable from their source. This distinction suggests that taste and smell are strongly associated with proprioceptively-based knowledge, as qualia strongly identified with experience connected with specific objects.

When we travel, especially to foreign locations, we are often overwhelmed by the food tastes and smells we encounter that are quotidian for the local people. What is savory to some may be sickening and offensive to us. I have some friends from north India that came to visit me. Although they were going to stay only a week, they brought a whole box full of spices and food items and the first thing they asked to do when they arrived was to be taken to an Indian grocery (not only for food, but to rent a bunch of Indian movies). I have many African friends and they always insist on cooking their food when they come to my house. I learned not to be insulted or to assume that they think I'm a bad cook; I simply know that food is fundamental to identity and to have one's own food when in a strange place is a way of being comforted, of feeling at home, of making oneself at home. I also have a Balinese friend who takes Americans to Bali to visit his village in the summers. One day I commented on how good the food was that his family prepared for their American guests of which I was one. He laughed and said, "Oh that's mostly Chinese food; Americans don't like Balinese food."

In America, we identify food by its country or culture of origin: Mexican, Indian, Chinese, Vietnamese, Salvadoran, French, even (and somewhat oddly) American. Interestingly, in many cultures I have visited, dining out does not involve the practice of selecting cuisine identified with other cultures or countries.¹³⁹ Rather, people eat their own food and find that entirely satisfying, indeed, necessary. The motivation for "eating out" may differ as

¹³⁶ Ackerman 5

¹³⁷ Ackerman 7

¹³⁸ Ackerman, 13

¹³⁹ I have noticed that there are trends in many locations now to find a variety of ethnically identified foods. Perhaps it corresponds with Westernization.

well; more likely convenience or for social interaction rather than to experience culinary differences. I would suggest that this strong association of flavor and odor, desire and tolerance for flavors and odors, is inseparable from the self-movement patterns that build and establish identity deeply in our flesh. It is because of the accumulation of our experience through the skillful repetition of cultural acts that we develop powerfully valued experience, the proprioceptive (movement/touch) basis for feeling oneself attracted or repelled by particular odors and flavors.

5 Gesture Posture Prosthesis

[perhaps replace or integrate with “Gesture Posture Prosthesis” that I revised for “Creative Encounters]

In her 2003 book *Color: A Natural History of the Palette* Victoria Finlay tells the story of the color orange by recounting a loosely historically based chronicle of a fictive composite character, Giovanni Leonardo da Martinengo, a Sephardic Jew forced to leave Spain at the time of Columbus eventually winding up in Cremona to contribute to the crafting of the renowned violins of Stradivari.¹⁴⁰ It is a story of mystery and intrigue; a story of suffering and exploration; a story of color and sound; indeed, these “senstories” become somehow inseparable with many believing that the beauty of the sound is related to the orange color of the varnish on the instrument.

As we have traced the various architectures that are relevant to understanding and appreciating the primacy of movement, to self-moving, to the animate organism that we are, we have followed an afferent trajectory, that is, a sequence of reflections on architecture beginning with those most deeply within and progressing in successive accounts outward to finally consider the physically bound and skin-delimited body. Yet, in every story of architectural levels along the way, the moving organism is fundamental to the content, the input, the knowledge that distinguishes and gives specific identity to not only the human version of animate organisms, but also to the specific individuals in the species. Frequent reference has been made to experience, both the awareness of immediacy and presence as well as in the sense of the accumulation that is essential to have an enduring impact of moving in an environment, the link that makes mere raw sensation and feeling into perception and knowing.

In the popular brain centered approach—it is the brain that makes us do what we do—the shaping of the brain, the content that seems present in the brain, even the evolution of the brain is often left vague and unexplained. The brain is often considered an organ that is itself capable of *representation*. So often the brain is described as containing a representation of the world or of feelings; the brain is something like a multi-faceted screen onto which is projected external reality and internal feelings. And somehow this “information” is stored for future use if needed. Alternatively, the brain is considered on the model of a computer or an electronic device. This *computational* perspective allows us to assume that the “circuitry” and “wiring” of the brain is similar to, if much more complicated than, that of computers. And we know how computers work to store information and to make algorithmic computations to determine decisions and behavior. We know about the input/output interfaces of computers. Both of these perspectives are effective folk understandings that seem undeniably supported by experience. Yet the representational and computational views of the brain are on the order of saying that the sun goes around the earth, that it rises and sets; this is the way things appear to us and unquestionably so, yet it is not how the earth and sun actually move relative to one

Comment [Office13]: Review and rewrite this whole chapter. Much good here, but the organization isn't good. Need also consult the book outline. Also review the chapter in DCR on gesture.

¹⁴⁰ see Findlay, *Color*, 2003 ???

another. These views of the brain are not biologically adequate and they tend to see the rest of the body as largely a collection of input/output devices in service to the brain.

An essential topic is how movement is translated into or can be identified with experience and how experience is capable of creating concepts, ideas, questions, and identities as well as carrying forth culture, gender, psychology, and history. Moving remains fundamental to these marvelous processes and to understand moving in terms of a complex nexus of posture, gesture, and prosthesis will help provide some sense of how movement becomes experience and how fundamental is experience. This nexus is on the order of architectural principles; those fundamental techniques and principles engaged in the design and functioning of a structure we might consider beautiful. The exploration of the gesture posture prosthesis nexus is the core of this chapter.

Now, back to the violin, to this exceptional magical violin. Among the many things that fascinate me here is the iterative groping process that leads to the creation of such an amazing instrument. Finlay's story recounts a long iterative process of collecting not only materials but also the knowledge and experience and skill that eventually come to cumulatively manifest in a single object. It is a groping exploratory process of experimentation and iteration. She shows us how each instrument produced receives, is made from, the accumulated wisdom and experience of all those instruments made before it. This is the appeal of craft itself; that fine practiced working of common materials—woods and resins and plants and tools—to produce something made with one's hands. Craft doesn't produce success immediately, but only in the long and highly iterative process of trying and failing and trying again; of repeating an act so many times that what it makes and does is scarcely separable from the craft action. Such objects are clearly the prosthetic extension of one's hands and body. We are aware of this bodied prosthesis in that our mind doesn't consciously direct the specificities of skilled performance of craft; we concentrate perhaps with a felt aesthetic inspiration and let the biologically seated skills that bear and are honed by our experience perform the fine movement essential to the accomplishment of our creation.

A friend of mine years ago was a potter, using a pottery wheel as her method of crafting pottery. She agreed to instruct me so that I might have this experience. Not sure I ever actually made a pot, but I did get my hands muddy and experience the liquid magical feel of the clay moving and shaping, seemingly itself, in my hands as they moved ever so slightly. She explained to me that in her training that the first year was spent mostly creating cylinders, the shape that arises from a lump of spinning clay that is fundamental to the forming of all other shapes. It is the endless yet mindful iteration that gradually gives rise to the cylinder being a prosthetic of the potter.

My granddaughter is a dancer. Although ballet is perhaps not her most enjoyed dance, she doesn't hesitate to appreciate the value of the endless hours at the barre. Repetition upon repetition is the basis of skilled dancing, even fundamental to improvisational dancing. Through the disciplined criticized movement, endlessly repeated, does the artful movement become a fluid aspect of all movement of a dancer.

I once had a friend who was a fine woodworking craftsman. His specialty was transforming spinning chunks of wood into beautiful artful objects—delicate paper-thin bowls or vases.

He helped me build a house, one since burned in a forest fire, and where I pounded and hammered away in the crudest and most expeditious ways, he delicately and skillfully cut and fit pieces together with exacting precision. I'd often tease him that we were building a house, not a piano. One of his greatest pleasures was to build the tools that helped him do his work with controlled precision; a piece of wood to accurately guide another through a saw, a kind of clamp device to hold objects so that he could work on them with exactitude. The tools he made were beautiful and durable. They were prosthetics to his skilled hands, expanding the range of his capabilities.

But a violin is a tool as well, is it not? Indeed, we call such objects "instruments" and I'm so fascinated that, as Finlay tells us, once made they must be continually played, that is, touched and moved, for them to retain the quality of their sound. These violins must be held and bowed and played every day, which means that the very grain of the wood must vibrate with sound that the instruments retain their sound quality and not turn back into simply beautifully shaped chunks of voiceless wood. This is amazing really, isn't it? As the human body requires constant practice—the ballerina (even professionals) spending hours at the *barre*, the craftsperson making precision cuts every day—the tools made in such a process—violins or ballerinas, for example—must also regularly practice and exercise to retain their skill and acumen.

I want to suggest that the creation of an object like the violin is not a simple prosthetic expansion of our bodies that we might extend our body's natural ability to make noises or sounds; think megaphones perhaps for this sort of tool. Rather, and I think this distinctive of our humanness, making sound and hearing sound, comprising a looping skill, can be developed to the point that we humans can imagine how to extend sounding/hearing progressively (and *necessarily* prosthetically) beyond our body's quotidian capabilities. Surely this gestural, prosthetic, transcendence is a measure of our glorious humanity. The violin is of us, of our imagination and our skill, but it also transcends us, soars beyond us. Isn't that grand!

Another wonder of the orange violin is its synesthetic character. The great fascination with the mystery of its orange color and the possibility that the color and appearance are inseparable from its sound quality is delightful. Taste and smell enhance one another; why not sight and sound? All sensory experience is based in touching/moving; each sense always already transcends itself and intermingles with any other sense.

Gesture, Posture, Prosthesis

I want to consider body morphology in diachronic terms, that is, in terms of how this morphology and its distinctive motility are shaped across time, both phylogenetically (shaped by evolution) but more importantly here ontogenetically (shaped by repetitive self-movement across the span of life). I often feel that the analysis of human behavior is limited because it doesn't include an appreciation for repetition, replication, and recurrence; all those attribute-associated "re" terms. Perhaps this absence or neglect is due to our romantic understanding of ourselves as being constantly creative and innovative. We have little tolerance it seems for redundancy and recurrence despite studies that show that generally we are thoroughly predictable beings.

Comment [Office14]: Include more background on gesture ... poor vs rich gesture, etc.

However, body morphology is customized and individualized and species-specific in terms of the gradually established patterns of distinctive movement that shape the very tissue of our bodies. Both continuity and plasticity occur in the environment of replication, repetition, redundancy as these impact gesture and posture; both phenomena of self-moving. And this way of appreciating the shaping of self-moving always involves an other. There must always be prosthesis, that is, a reaching out, transcending the self, complementing and extending self towards, into, the other. In the analysis of movement, we have such difficulty keeping the moving in the living because of our propensity to halt and objectify even action. Yet, I believe to develop the ideas of gesture, posture, and prosthesis as comprising a dynamic nexus offers a strategy for keeping the living in life, to keep the movement moving.

If perception is skilled action then so are knowing and living. Even the potential of this perspective is attractive including application to practical life. It is empowering and vitalizing to approach living our lives as honing, developing, and exercising skills that are constantly being refined through our practicing them in the living of our lives.

Carrie Noland's 2009 book *Agency and Embodiment* offers insight and inspiration as she articulates "gesture" as key to understanding agency. Already we should be interested. Since we have found movement so fundamental to all we have done, we must see the potential of gesture, a form of movement.¹⁴¹ We may have limited and perhaps vague understandings of gesture at this point,¹⁴² but we must begin to accept that there is something of a mandate for us to vigorously engage an exploration of gesture, to develop a more sophisticated understanding of gesture.

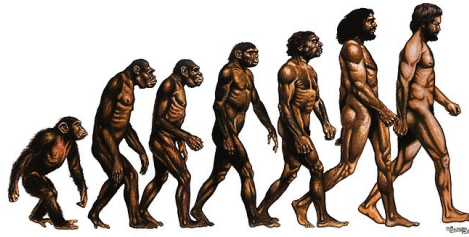
Noland observed that both Maurice Merleau-Ponty and André Leroi-Gourhan "viewed the body as a sensorium extending itself prosthetically through gesture into the world."¹⁴³ This observation is important to understanding the architecture of human connections with and actions on the community and environment. These scholars considered the body as a sensorium, that is, as the hierarchical composite of sensory capacities. They consider the body extended prosthetically into the world through gesture. Prosthetic suggests a means of supplementing and extending the biological body. This means that we humans are able to use aspects of the body, themselves, as "tools" in some sense, to extend ourselves into the world and have an impact on it. Provocative. Prosthetic here suggests an extension beyond self, a transcendence beyond the biological limits of the body as a contained object, beyond the recognized boundary marked by our skin. Yet, of course, we know that we are through and through biological. Something here is familiar. The prosthetics of the body, its

¹⁴¹ A quick aside, the influential religion scholar Jonathan Z. Smith indicated in a lecture presented in 2010 at the University of Colorado his belief that gesture studies will be central to the academic study of religion as it unfolds over the next generation.

¹⁴² Interesting parallel here to the limited understanding we typically have of the other senses. We consider gesture typically as a substitute for a message of language, reducing everything to meaning and message. We have to get to a richer understanding. I've developed this rich understanding of gesture in chapter in my 2012 *Dancing Culture Religion*.

¹⁴³ Noland, *Agency and Embodiment* 5

capacity to use itself, or parts of itself, as a tool, are highly interesting in that prosthesis must exist if we are to avoid total containment, isolation, separation; in psychological terms aloneness; not to forget immobility.¹⁴⁴ Yet, this insight related to prosthesis is but a restatement of the radical view of self-moving; that self-moving essentially requires a moving in the context of other, that environment is copresent with self. This suggests that, as we have discovered in our considerations up to this point, movement across gaps—the copresent condition of a twoness inspired or driven to desire or seek a oneness—continues to be at the core of agency and cultural construction. Gesture is the sort of movement, I am suggesting here, that is stamped by culture, environment, history, psychology¹⁴⁵ that enables us not only to engage the world perceptually (as in that more passive notion of sensation) but also to act on the world, which we'll see is to understand sensation/perception/knowing as agentive, as a force acting on the world. Thus, the sensorium is connected with culture, history, and psychology by means of gesture, the sort of movement that extends the sensorium prosthetically into the world. Gesture (inseparable from the sensorium) is the prosthetic (the extension beyond the organic confines of the physical body, that is, beyond the skin) that extends the body in the interaction with the world beyond the physical limits of the body. Gesture is the looping reversible circulating interconnection among people (animate organisms generally) and between people and the environment; it is by means of the movement of gesture that we are imprinted with, constantly absorbing, the influences of culture, history, environment, experience; it is by means of the movement of gesture that we have agency, power, impact on the world we live in. It is through the sameness of gesture that we may forge change in ourselves and in that beyond ourselves.



More on gesture, but first it must be understood that gesture and posture are interrelated. We tend to think of posture as static, as a fixed position, but posture is itself a sort of movement that we might think of in terms of *tonus*, the vibrant tensions between opposing muscle groups and complementary proprioceptors (annulospirals and GTOs), as posture is a bodily dynamic readiness that is the foundation shaping and enabling all gesture, all bodily movement. We might think of posture as “carriage” as it is sometimes termed, suggesting that posture is how we carry ourselves as we move. Posture has global impact on both one’s identity and one’s impact on the world as affected through gesture. If posture enables and restricts gesture, and if gesture is how we interact with the world around us, then posture conjoins with gesture in our consideration of living movement.

¹⁴⁴ Not loneliness because that implies a longing for a missed other. By aloneness I want to try to imagine a world with no other.

¹⁴⁵ Marcel Mauss’ classic 1937 essay “Techniques of Body” lays the groundwork for demonstrating that “gesture,” that is, techniques of body, are never either “natural” or “perfect,” but always formed in the influential context of culture, history, and psychology.

With this introduction, I want to interconnect gesture, posture and prosthesis to outline how they co-implicate one another comprising a nexus. Posture as the foundation of gesture is a place to start. Gesture, even in the most mechanical sense, is shaped, enabled, and limited by posture. Perhaps the easiest way to grasp this idea is to consider the shifts in posture that have occurred in the long journey of human evolution. It is common to even depict evolution in terms of a shifting sequence of postures from quadrupedal to bipedal motility accompanied by an increasingly upright posture. The last part of the sequence often charted as the knuckle-dragging ape posture through a progression leading to full upright posture and motility. Shifts in posture co-occur with shifts in motility, both style and variability. Shifts in posture co-occur with changing roles and prominence of hands and face. The current stage *Homo sapiens* features erect posture with prominence of hand and with the locus of the senses centered in the face located on a freely rotating head. The arms are well developed for widely varied articulation and the hand is distinguished not only by a prehensile thumb but also by delicate well-articulated fingers. What is commonly overlooked are the feet. With bipedalism, the feet take on a different role. Even simple walking requires momentary balance on a single foot. And, like riding a bicycle, balance is more easily maintained by the continuing movement of walking rather than standing. To accomplish this balance, the feet have developed with three prominent connections to the ground, offering a triangular platform that is quite flexible as well as inherently stable. The evolution of the feet change motility from a design that works best with uni-directionality, to a style of motility that enables spinning and turning in place, in other words, dancing. Human feet are dancing feet. The evolutionary changes in center of balance necessarily correlate with changes in the biology of balance involving many systems from the feet to the ear (vestibular system) as well as the entire proprioceptive systems.

Even in the present stage of evolution, variation in posture is reflected in change in motility. The kyphotic posture that is common to contemporary hunched over desk and computer work, rounds the shoulders, hangs the head over the body, restricts movement throughout the body. Kyphosis correlates with a life of learning by methods that are movement discouraging (which encompasses much of modern western education). Educational settings are where we shape ourselves, shape our minds, but we also have a corresponding shaping of our posture and our gestures/motility; learning and how we learn is inseparable from posture. It can be strongly argued that the control of posture and the accompanying impact on motility has as much impact on shaping who we are and what we know as do the intellectual and informational content of what we are taught.

Furniture and workspaces (classrooms and offices) are extensions (prostheses) of our posture and they reflect and affect who we are. It doesn't take Charles Darwin to predict the evolutionary shift in body shape and motility resulting from a few millennia of spending the bulk of one's life seated in a confined space leaning over a work surface. Indeed, studies of posture and gesture suggest that furniture and workspaces must be seen as tools and tools are prosthetic extensions into our environments. Furniture



and workspaces are our prosthetic bodies and function in a sensory capacity to both shape who we are and to have agency, in projecting our bodies, into the world. We must begin to understand that to look at a classroom with movement-discouraging furniture and to look at workspaces comprised of tiny cubicles is to look in a mirror at our own bodies.

Human development throughout the course of our lives can be charted in terms of motility features that correlate with posture. Infant development is specifically described in terms of stages of motility development, from the infant incapable of even rolling over, to



creeping, crawling, standing, toddling, walking, and running. Each of these stages of movement development correlates with changes in posture; these changes in posture correlate with changes in body structure. Then the aging adult is tracked in terms of movement, but more subtly so. Interestingly there is a decline in both the urge to move and in the capability to move by early adulthood that continues progressively through the balance of life. Lifestyle,

occupation, correlation of activities with chronology, and so on all involve a progressive decline of movement. And, again, posture correlates with movement, with the extent and character of movement. I suggest that a person's age is readily revealed as much by his or her postural-movement style as perhaps by any other measure.

Posture correlates with emotion, with mental health, with feelings of vitality and life, with psychological well-being. Pathologies such as depression are named for their strong correlation with postural disposition.

Let us ask, what causes changes in motility and posture over the life cycle? I question if the physiological processes of aging are the principal causes of aging any more than are the cultural expectations regarding motility and the environmental/social influences on posture. In other words, we physically age, at least in part, because our cultural expectations create situations that shape posture and that discourage movement accompanied by lifestyles that directly discourage movement. The combination contributes, I suggest, to decline in mental and physical health and to accelerated aging.¹⁴⁶

The looping interactive self-adjusting network principle is fundamental to our biological architecture in every component. This awareness must be paired with an acknowledgement of our considerable plasticity, that is, our ability to change at every level. Our posture reflects our identity, but our identity is inseparable from our posture. To change our posture is also and necessarily to change ourselves. Should any of these correlations then be of value, purposefully and consciously shaping our posture should impact who we are. When our moms told us as kids to stop slouching and to sit up, they were not, I suspect, primarily concerned about our physical postures. They were saying something about who they hoped we would become; upright alert active people, not lazy

¹⁴⁶ I fully admit that this position is a personal one; a part of my crusade against accepting the link between chronological age and a decline in movement and a shift in posture.

slouching inactive people. Posture therapy is widely practiced, often in association with the relief of pain, yet also often for psychological and other health benefits.¹⁴⁷

Now, let us turn to gesture. I want to begin with the consideration of the gestural implications related to the act of palpation. Palpate. To what does this word refer? It is to examine something by touching and pushing on it with one's fingers or hands. It is a common method used by physicians to examine the abdomen or other soft body parts of a patient. What is going on? The fingers or a hand, rather than a mechanical tool, is used in the same way one would use a tool. The fingers are used as tools—pressure variable probes with built in sensors, proprioceptors—guided by the physician, whose fingers they are. Palpate suggests touch, but something more than just touching. We sometimes use the active term “feel,” as in “feel that hard spot,” to indicate an exploratory, searching kind of touching, a groping about for something. A physician may be investigating a place that the patient reacts to with signs of tenderness or pain or it might be a hard internal mass resistant to pressure. Palpate then indicates a use of the fingers/hand as a sensitive groping or probing tool. The tool is used to examine and thus to learn something about the condition of a patient's body, most often an internal unseen part of the body. The function of the palpating tool, the fingers or hand, is dependent on it also being sensate, that is, something that feels, something that knows by feeling. That is, this tool must be something that can evaluate the pressure, movement, reaction that occurs in response to the purposeful touching encounters.

We also know that a physician must be trained to palpate properly and effectively and that this training involves both a thorough knowledge of anatomy and physiology and pathology, that is, one must know about the patient's body what cannot be seen. And the physician under guidance of a mentor must practice palpating a great many patients before she has acquired the skill level to be trusted with decisions involving health and life. Palpating is *a way of seeing* what cannot be seen with the eye and, if we imagine ourselves in the act of palpating a body, we likely will imagine ourselves with eyes unfocused so as to “see” not what our fingers are touching, but what our fingers are feeling.

In this example then our finger/hand is transformed into a gestural technique, a prosthetic extension, a tool. This tool is effective as a tool only if shaped by guided practice needed to become a skilled gesture, that is, by sensorimotor-muscular skills gained through the experience offered by proprioceptors and accumulated in synaptic criteria. The tool is effective only if it is at once also a sensate perceptive body, that is, a proprioceptively active movement that allows one to “feel” the consequences of the gestural movement encountering the object of consideration, some aspect of a patient's body. Indeed, to become skilled this feedback adjustive aspect is essential. I suggest that the simple, rather intuitively graspable, example of palpation, offers us a pretty good understanding of what Merleau-Ponty, Leroi-Gourhan, and Carrie Noland have been concerned with in terms of gesture.

I want now to briefly overview and summarize various terms and implications of the gesture, posture, prosthesis nexus.

Comment [Office15]: Integrate these points in narrative and with exzamples. Consult the outline for the book to do this chapter properly.

¹⁴⁷ Erin Manning feels that posture should be left along ... where does she say this? Add comments about this here.

- **Prosthesis.** Gesture enables the body or parts of the body to become prosthetic, or extensions to the body, thus expanding the body into the space beyond the body's sensate limitations. This capacity of the body is the opening towards the construction of tools of every sort from pointing fingers to spear points to tablet computers. All tools extend the body prosthetically into the world for purposes of connecting with, palpating if you will, the world about us.
- **Groping/*tâtonnement*.** Gesture then is characterizable as groping. Noland discusses Leroi-Gourhan's term *tâtonnement*, which means trial and error, but also refers to the groping movement of the hand or other body part as prosthesis.¹⁴⁸ But this groping is not simply random. Sensorimotor programs and proprioceptive-muscular acuity direct it. Sheets-Johnstone suggests that we come into the world moving, groping, as the means of discovering the world and ourselves. This process continues on in all gestural actions in that they are programmed sensorimotor/muscular movements. Even more importantly, gesture is self-adjusting, self-correcting, refined, based on experience. *Repetition* has a central role of critical value.
- **Agency.** Gesturing does something to affect the world; it has agency. It explores the world in the same way a physician palpates a patient's body. Not only does gesture do simple things like get attention, Leroi-Gourhan believes that the development of gestural patterns leads to the invention of tools; this was a central contribution to his work in paleoethnography. Movement necessarily precedes, he argues, the development of tools. It is the movement of the body and the use of the body or its parts as tools that are then extended beyond the body with the invention of mechanical tools. The body's movement is projected prosthetically beyond the body in the creation of tools. Where the fist can serve as a ram or a hammer, the invention and construction of prosthetic rams and hammers, physical tools, has the effect of amplifying and multiplying the gestural effect. One aspect common to all gesture is the agentive concern of interrogation or exploration. As in palpating, we reach out with hand, or tool, to learn about our environment. The interrogative aspect of gesture (tool use) can be comprehended by recalling proprioception. As we move and encounter the environment, our proprioceptors register, both as "feel" and as feedback that impacts our neurobiology to the extent of changing our tissues as well as our synaptic criteria, the effect of performing the gesture; and it is the moving that is felt not a retrograde reconstruction of movement. As the ram encounters the wall, as the hammer encounters the nail, we learn many things—the consistency and composition of the wall, the reaction of the ram to hitting the wall, and so forth all as feelings sensed and recorded by our proprioceptive system. Even our brains, Leroi-Gourhan argued and Noland found it supported, developed in response to the advancements in motility, thus gestural acumen, rather than the other way around.
- **Plastic/Self-adjustive.** Gesture is always encounter. Encounter is always felt proprioceptively. Proprioceptive experience provides modifications via synaptic criteria to neuronal group formation and thus to sensorimotor programs, memory, and concepts as well as to proprioceptive-muscular acumen. Gestures are skills and the performance of the skilled action increases the level of skill. Gestures are not only what

¹⁴⁸ Noland, ??? 105

we do, how we move; gestures are also who we are in that they are inscribed in the functioning of muscle, proprioceptor, sensorimotor program, engram.

- Repetition. Clearly no palpation is possible with a single iteration. There is an implication in the nature of palpation itself, the exploratory repetitive aspect of groping. Yet, perhaps the reason that medicine is referred to as “art” and as “practice” is because it depends on gestural methods that always continue to improve with repetition and experience. Repetition functions to improve the skills of palpation in at least two ways. As the physician knows from textbooks and anatomy classes what it is that her palpating is “seeing,” subsequent surgery or autopsy allows the confirmation or adjustment of what was actually there. Secondly, like a ballerina at the *barre* repeating designated movements thousands of times under the sharp critical direction of a ballet master/mistress, the act of palpating a patient under the direction of an experienced physician, leads to building palpating skill residing in the neuronal groupings evident as sensorimotor programs and muscle acuity. Repetition is essential. What we typically do not understand is the extent of repetition necessary. I rather like the ten thousand hour rule of thumb as the extent of repetition needed to gain mastery. Repetition is also linked with plasticity. We are constructed so that our experience clearly has an impact on our biology, yet fortunately (I think also of the fortunateness of the relative slowness of neurotransmission speeds) we are plastic/changeable only through considerable repetition. Otherwise, incidental and accidental experiences would have perhaps too profound an effect on our skills and they wouldn’t endure. The irritating persistence of “bad habits” is akin to the protection against too rapid plasticity.
- Prosthetic/sensate: Gesture is movement that allows us to be at once a prosthetic (tool, technique) and a sensate feeling being and, more importantly, to be both at once; copresent. Merleau-Ponty referred to this as “double sensation.”¹⁴⁹ Many, if not all, animate organisms have this capability, but surely it is distinctive of humans to have an awareness of ourselves *at once* as techniques, tools, prosthetics and also as sensing feeling knowing bodies; awareness and retrograde halting awareness of our awareness. There is no clear boundary between the two.
- Synesthetic: Gesture is movement that is synesthetic in that it crosses among the senses and combines them. The movement of gesture creates knowledge, images, feelings that can be specific to any sensory channel or to cross among and combine them. Tools, prosthetics, are gesturally based, argues Leroi-Gourhan, and thus it is in the probing motions of the body that we not only construct the world about us but also experience it. Musical instruments are prosthetics that extend, through the use of body motions in gestures we refer to as “playing,” ourselves into the world and we hear the world that we make. We can also think of the actively driven use of our individual senses in the same terms as we think of palpation. For example, when we say “I looked carefully at that painting,” are we not using our eyes in the same way that a physician uses her palpating fingers? When we say, “I listened intently to that music,” are we not using our ears in the same way that a physician uses her palpating fingers? Are we not transforming our eyes and ears to become tools, techniques, that through skilled use prosthetically extend our senses into the world to explore and penetrate it, by means of

¹⁴⁹ (Noland 110), but get the Merleau-Ponty source.

gesture, for we move our eyes to see a painting and we turn our heads to listen intently to music? We do not explore the world sense by sense and then add them together in some secondary constructive or synthesizing operation. We sense the world as the world; not attributes separated by sensory channels. Perception is “iconic” in Peircian terms; whole and already together, for that is how we encounter the world as a world even as we are also constructing it, making it present, by perceiving it.

- Recognition/Evaluation. Yet, this ability to prostheticize our bodies, part by part, function by function, or in its entirety, is always paired with the intimate proprioceptively trained feeling kind of knowing that is both recognition and evaluation. Indeed, a good case can be made for perception being as much recognition as discovery. Perception always engages the full experience of our perceiving lives compacted into “experiential neurobiological ensemblings” (see the following chapter) and these are always an aspect of every perceiving. These looping functions that feed forward and backward are complementary and essential to one another. We listen to music, as the skilled physician palpates a patient, recognizing so many things—rhythm, melody, color, our favorite artists, even the events and emotions associated with a particular song, and so on—which demands that we already know what we are hearing; recognition. But despite recognition and foreknowledge, it is also always experience and experience is always new in some respects, if only in its being present (or in its presence); a comparative listening responding to the variations of what we hear with our expectations, our foreknowledge; evaluation. Foreknowledge has, of course, a copresent implication. Foreknowledge will become a most interesting issue as we consider perception. It will become an important factor in my presentation and discussion in a later chapter of “fat present.”
- External Memory. A major contribution of Leroi-Gourhan was to recognize that gesture as it developed in humans led to the distinction of humans in the capacity to develop external memory. First, it should be noted that language (speech first) is to be understood as a tool. Clearly to speak is a gestural extension beyond our bodies in an act of agency and expression. Jacques Derrida and his student Bernard Stiegler both extensively developed this idea based on Leroi-Gourhan’s influence.¹⁵⁰ A key notion however is simply that to use a tool to mark on a wall establishes an external counterpart to memory. Leroi-Gourhan found this distinctive of being human and as essential to human development linked with the advance of tools that are associated with external memory—pens, printing press, typewriter, audio-recorder, video-recorder, 3-D printer. All these, Leroi-Gourhan holds, are based in gesture.

Finally, although I think Leroi-Gourhan should not have been so concerned, simply because movement is so fundamental and ubiquitous, he foresaw a world in which the decline of movement would lead to the decline of humans. He posited, “humans divorced from movement may fail to take shape at all.”¹⁵¹ Quite remarkable!

Comment [S16]: Decide if this is the language I really want to sue. Assembly or ???

Comment [S17]: appropriate

¹⁵⁰ Cite Derrida and Stiegler on this ...

¹⁵¹ Noland, 117

Posture, Gesture, Tone

Question! Let's say that we have an experiment. It is an experiment on the order of "the flying man" that was popular several centuries ago; I discussed this experiment above related to Condillac and Maine de Biran. For this new thought experiment let's divide a batch of people into two groups each group comprised of members that are more or less similar to the other group. One group we instruct that they must sit down for everything they do in their lives other than those things required for quotidian maintenance. They must learn, work, travel, and entertain themselves in a sitting position. Now members of the other group are not allowed to sit down other than when necessary for some maintenance functions and they are encouraged to engage in vigorous demanding self-movement at least one hour every day. This is a long-term study so we keep this process going for 25 years. At the end of the study (and maybe periodically along the way) we ask the participants a range of questions about the conceptions they hold on matters related to the relation of their brains to their muscles, where their feelings reside, what initiates their feelings, what is their concept of their mind related to their physical bodies, their conception of how they learn, their sense of what is important in life, their propensity toward creative ideas. The general question is this: Would these two control groups have similar answers to these questions?

I think that we often have things backwards. A history of centuries in which our intellectuals have sat down most of their lives and developed gestural patterns restricted primarily to their fingers and eyes, and whose body core and tonus (the muscular system that senses gravity, movement, and maintains muscle tone) are poorly developed and often barely functioning create a kyphotic and c-curved posture to bring the eyes and hands closer together over time. Likely this group of folks would develop an entire set of concepts based on the separation of the mind from the body with the mind considered much the more valuable. They would likely ignore any input the sensual body might offer (we can only imagine what that input might be, but we'd get a pretty good idea by watching the endless TV ads for digestive aids). These folks would highly value only those objects closest in hand (books and handheld electronic devices). Most important to these sitters would be books and fixed versions of words (and at that books that are primarily abstract and ethereal ... conceptual and "high minded"). Space preference would tend to indoors to desks and to cubicles. Favored topics would be pain and evil and temptation and theology and morality and reality (did you ever consider what sort of person one has to be to contemplate the question "what is real?"). Sitters correlate with specific valuations and perceptions. The point is that I think there is a powerful link between postural and tonal acuity and the way we experience and conceptualize life. In this case, this sitting group represents pretty much the postural and tonal habits of the intellectual, the ecclesiastical, and the business class in the west for the last several centuries. The current trend among workers has been toward desk jobs in cubicles rather than physically active jobs in manufacturing. I suggest that the absence of solid core muscles in the body and poor acuity of the neuromuscular systems that maintain muscle tone and balance, accompanied by the restriction of self-movement, correlates with the core concepts that have increasingly shaped the last few centuries of western culture, religion, and intellect. Whether the movement practices or the worldsense is the cause is a question we needn't answer, but the correspondence is, I think, undeniable.

Now, can you imagine any of these concepts being held by, or even being conceivable to, members of the second group, the movers. This group, constantly moving about and regularly participating in demanding self-movement, would have a solid strong muscular core with refined neuromuscular tone to maintain a posture that is balanced and pain-free. The posture would be upright with high tonal acuity allowing rapid improvisational movement that would not only be efficient, but would feel satisfying, even pleasurable, to perform. The lives they would live would be for the most part characterized by the Italian term "*sprezzatura*" which means apparent effortlessness, as in skill and long intimacy performing that skill. Since we live largely in a heritage of the first group is it even possible to imagine that the second group would conceive of any role for the intense engagement of the brain? Our heritage says likely not (we identify movement and body acuity with the absence of braininess), but isn't this likely wrong? I teach dancing and I've often had people tell me that their brains hurt after an hour of demanding dance movement. We all know how engaged we feel our brains are when we are learning physical skills. Is there any reason to believe that members of this group of movers would not be able to develop active intellectual lives and the postures and prosthetic extensions (tools) that would relate importantly to a whole bodily active movement emanating from core strength and muscle tone? Perhaps the prosthetics of intellect would be shaped in ways compatible with what we now consider sports equipment or entertainment gear. Might we imagine that communicating ideas might involve more active methods like physical theater and dance and performance art and activities involving touching (God forbid) and physical interaction? Might we imagine that writing and reading would be done using methods that are not physically and movement confining? Might we imagine that our hours spent with limited movement become over time gradually balanced with those hours spent moving? Might we not imagine that we shift our expectations so that intellect is related as much to core strength and tonus as to mental functions? Would members of this group likely be impressed by fMRIs and an accompanying narrative telling them that certain behaviors occur because of the actions of a spot in their brain? Can we not feel certain that simply the shift in our posture (supported by core strength and engaged muscle tone) would completely reshape our lives, our concepts, our values, our health, our culture, our identity, and virtually everything about us?

Okay, this is a thought experiment, one we can risk because we are in the confines of the academy sitting comfortably with relaxed cores and no engagement of a physical sense of effort. But I do not take this as only a thought experiment. Indeed, as a dancer and one who has many decades of active movement and attention to core strength and posture I believe that I have evidence (though anecdotal). I consider this issue to be an important challenge of future generations. And it is not without considerable support in scientific studies such as those conducted by Stanford scientists Marily Oppezzo and Daniel L. Schwartz that demonstrate that creative thinking is increased by walking.¹⁵² What is typical of this study is that it is a short-term study; can one imagine if such studies engaged

¹⁵² Oppezzo, M., & Schwartz, D. L. (2014, April 21). Give Your Ideas Some Legs: The Positive Effect of Walking on Creative Thinking. *Journal of Experimental Psychology: Learning, Memory, and Cognition*. Advance online publication. <http://dx.doi.org/10.1037/a0036577>. This article has an extensive bibliography.

differences over a quarter century of those who lived a “walking lifestyle” or who spent the majority of their time in active movement?

The proposition here seems radical doesn't it? That our concepts, our beliefs, our perceptions of the world are shaped by our gestures/postures? But isn't this the implication of the basic proposition I have been contemplating throughout the book? We know that we are born into the world moving; moving with basic gestures that involve the old brain (the basal ganglia). We know that through the groping of these gestures our moving/touching encounters with the environment provide us with the basic experience for beginning to conceptualize the world and our own bodies. This process requires the actions of proprioceptors that amount to the “sense of effort” that translates into gestural patterns that support posture that creates body structure. The sense of effort that is felt (experienced) in proprioception has considerable influence on our conception of self and world. The sense of effort confirms as a feeling kind of knowing what we sense and believe. This kind of knowing is knowing in the most assured and fundamental way. In “The Will to Power” Nietzsche put it this way, “Our most sacred convictions, the unchanging elements of our supreme values, are judgments of our muscles.” Is it possible “to conceptualize” if we don't have a hand constructed “to grasp?”

I have persistently insisted that a one-way process likely doesn't exist. Movement/touching always implies this twoness, this oscillation, this opening that is moving. So too with this process I have been considering here. We can certainly say that presently in contemporary American cultures there is a broad incidence of lifestyle that is based on extensive sitting and progressively decreasing mobility through the course of life. We can say that the physical world of prosthetics (furniture, architecture, transportation, learning, educational equipment) is strongly shaped by the urge to project the resting/sitting/reclining body; a body that concentrates on replacing actual movement/touching with virtual movement and touching enabled by prosthetics that project largely in the beach ball shape that extends in front of our bodies connecting eyes/ears/fingers into an all important interrelationship. But then we can look historically for the lineage that has led to this connection and we find it located in the shift from orality to literacy, literacy to print, print to industrial manufacturing, industrial manufacturing to electronic communicating devices like telephones and recorders and so on. We might also trace this connection historically in terms of the ways digitization has developed; counting on fingers, to counting devices like the abacus, to comptometers (1960s), to electronic calculators, to computers, to digital representations of the visual, to digital devices that support the Internet (since the 1980s), to the increase in capacity to store endless amounts of information available anywhere in the world, to the invention of algorithms that support Google search, to the miniaturization of pixels adding remarkable density to the point of the quality of retinal displays (i.e., those that are sufficiently dense and small as to match the capacity of the retinae to discern the effects of a single pixel). Both of these heritage tracks chart an accelerating process of identifying intelligence and knowledge increasingly with information: the increase in the quantity information, the segmentation of information, the ease of access to information, the replacement of experience and judgment with information, the sense of the objective that is associated with information, the

retrograde movements and backfillings required to comprehend information.¹⁵³ Both of these heritage tracks chart a process of shifting understandings of the human body that values of the mental recognized as separate from the physical and that marginalizes the physical. Both of these heritages correlate with a shift in gesture/posture: from upright walking moving posture to an increasingly sitting posture, from gestures engaging the whole body (walking running labor) to gestures confined largely to the hands and eyes, to a posture depending on artificial support, a body with flaccid core and little tone, to obese pear-shaped core, to the focus on the hands to the exclusion of the feet (which evolved importantly to permit bipedal motility and erect posture with strong core and high levels of tonus). Thus gestural postural practices support the continuing development of the accompanying prostheses, conceptualizations, technologies that in turn reshape gestural postural practices. It is a cascading cycle, a spiral; whether it is understood as one of advancement or decline—rather than strictly an oscillation of maintenance, of autopoiesis—is based on one's values and they are invariably historical and cultural, yet the direction of the trajectory is clear.

If there is anything that should emerge as essential from these observations it is that we are whole beings discovering and creating ourselves and the world through our interaction, through gesture posture prosthesis, with our own bodies interacting with the environment in which we find ourselves. This means that perception is not passive but active and is the way that we both distinguish ourselves from the world as well as have an influence on the world. This means that perception is based on movement/touch and that our sensory lives are interwoven with our activities, most skilled in some sense, of moving and interacting. Intellection (that is the conscious deliberate reflection on some topic) is not the only way we learn; indeed, even intellection can never ever be separated from biological processes, grounded in proprioceptive moving/touching, that function as resonating vessels so utterly complex and networked as to defy any orderly arrangement in either time or space. The way we influence these sub-conscious processes is through our routinized skill-based bodily experience that, through repetition, creates gestures and postures that carry our deepest values and capabilities as sensory engrams as well as memories and concepts and images imprinted in our very flesh (neuronal groupings). Our lives should be lived as skillful performances striving to achieve a feeling of *sprezzatura*, an effortlessness and ease that is confident and enjoyable, as much as we live as intellectually calculating retrograde movers attempting to somehow find meaning in or to offer explanation for what has already gone by, for what is at a distance; even this retrograde movement should be seen as a postural/gestural based skill practiced so that we come to perform it as well with ease and confidence.

Now let's circle back to talk about the biological basis for posture, tone. Muscle tone is an enormously complex task that centers on two reflex arcs involving our old proprioceptor and muscle friends, the muscle spindle/annulospiral and the Golgi Tendon Organ; one excites the other inhibits to keep muscle fibers active within a narrow range of tensional force so that they are ready for action. These constantly interacting forces function like an oscillation or a playing between the two tendencies. That is they are always in movement.

¹⁵³ For a much fuller consideration of the transition to "information" see my "Into the Future."

This oscillating controlling tone is then like sound in its harmonic vibration. It is what Erin Manning might refer to as *preacceleration* or Brian Massumi as *incipience*. Tone is the vibrating oscillating movement that anticipates and enables smooth or controlled movement. Interestingly, tone provides a kind of moving stability that makes movement possible. This background tone underlies posture, which, while itself is based on movement or tone, is the stable frame that allows parts of the body to move; it supports gesture. Tone is also the way the body maintains, through movement, its own stability. For example, almost any simple movement in the body, such as, when standing, the raising of an arm to the side, changes either the length or tension values in most of the body's muscle cells; that's a lot of adjustment that we typically are unaware of. Tone acuity is the ability of the entire musculature to participate in the motion of any of its parts and it must feel the results of its own activity to accomplish tone. To advance the musical metaphor, tone is not like the body simply playing a single note; it is rather like a symphony of sounds each played by different muscles all harmonizing to create music; or it is the sounding of many voices together in a self-adjusting organic network.¹⁵⁴

Appreciating tone helps us understand the integrity and interconnectivity of the entire body. Any action of any part of the body initiates a cascading reverberating flurry of adjusting responses throughout the body. It would be naïve of us to think that tone is limited simply to our quotidian muscular capabilities. Since it is the techniques of the body (as Marcel Mauss demonstrated), that is, our gestures, that bear our culture, our history, our personality, then tone is the platform that allows these techniques to be performed. Tone allows us to enact who we are. But certainly also we must understand that tonal acuity influences who we are as well in that it enables or disables our gestural actions. Since we feel tone and tone reflects how we feel, then tone is also inseparable from our entire emotional landscape.¹⁵⁵

¹⁵⁴ In my "Into the Future" I develop a trajectory towards a new harmony developing upon notions of harmony from Pythagoras through Kepler.

¹⁵⁵ This is but a brief introduction to tone, tonus, resonating vessel. I'll develop these ideas much more fully in a Chapter 8 "Fat Present"

6 Experiential Neuronal Ensemblings

enchanted loom, where millions of flashing shuttles weave a dissolving pattern, always a meaningful pattern dynamic, an abiding one
~ Sir Charles Scott Sherrington¹⁵⁶

Although settling, resonating, and twinkling are all properties of the same neurobehavioral dynamics, perception and action systems seem to reside mostly in the twinkling, metastable regime.
~ J. A. Scott Kelso¹⁵⁷

Adaptive behavior is an emergent property which spontaneously arises through the interaction of simple components. Whether these components are neurons, amino acids, ants, or bit strings, adaptation can only occur if the collective behavior of the whole is qualitatively different from that of the sum of the individual parts. This is precisely the definition of nonlinear.
~ Farmer and Packard¹⁵⁸

here

Zombies. Since 1968's *Night of the Living Dead* contemporary American culture has been obsessed with zombies although in that film the late director George Romero called them "ghouls." The history of contemporary film and fiction zombies derives most directly from 17th and 18th century Haiti, known then as Saint-Domingue. {develop from Atlantic article and then introduce the correlation between body and motility and zombies; also the notion of metastability (i.e. living dead) and nonlinearity (collective behavior of the whole is qualitatively different from that of the sum of the individual parts) or the notion of non-calculability or predictability}.

Comment [Office18]: yep this will work

What makes Zombies so fascinating? At the risk of boring us out of our affection for Zombies I'd suggest that at least part of the fascination is that Zombies manifest the impossible. The descriptive term "living dead" catches this perfectly. These terms have meaning only in that each excludes the other. Either a thing is dead or it is alive; never both; yet, that is precisely what distinguishes Zombies. I've labeled this aesthetic of the impossible with the term copresent. Neuroscientist Jack Kelso and many others have indicated that this same condition is typical to the workings of the brain and nervous system, but also any large self-adjusting network. Brains can and commonly are confronted with oppositions that in their copresence generates an oscillation rather than a dissipation and this oscillation is generative of brain functioning, brain vitality. The field of coordination dynamics studies metastabilities in the brain and in other complex self-adjusting systems to comprehend how their common metastability is fundamental to their distinctive functioning.

Another aspect that I think keeps our interest on edge is the unpredictability of Zombies. Sometimes they seem just to stand and sway, unaware of their environment. Yet, anyone

¹⁵⁶ Sherrington 1953: 184

¹⁵⁷ Kelso, 225

¹⁵⁸ (as quoted in Gleick, 1987, p. 339 as quoted in Thelen and Smith, p. 45).

who has ever seen a Zombie movie knows that it is the unpredictability of the Zombies that keeps us on the edge of our chairs and prone to scream at any moment. And rarely does a single Zombie act alone. Once they are triggered to act, they act collectively as a huge threatening organism. This distinction of Zombies is what Farmer and Packard describe as nonlinearity. It is the action that defies perfect prediction. In the nervous system and other complex self-adjusting networked systems, it is the presence of random variations and things incalculable that play a fundamental role in the action of system. It is in this nonlinearity that the system may generate the novel and have a bootstrap to creativity.

Risking a bit more comment trying to enhance our understanding of Zombie fascination I suggest that brains (and bodies) and motility offer other insights. Zombies, like so much of popular culture, are attracted to brains. As Zombies literally consume brains, the general population seems to want to consume all the information it can about brains and to attribute the brain as the seat of vitality and agency. Most fascinating to me is the lurching foot-dragging motility distinctive of Zombies. An alternative to the “living dead” Zombies are often referred to as the “walking dead.” I’ll explore the importance of the experience of smooth movement as fundamental to our criteria for coherence. Zombie movement is anything but smooth movement. They start and lurch along. Their bodies are ruination. They personify incoherence and the impossible.

Zombies then, I suggest, are perhaps so interesting because they personify *metastability* and *nonlinearity* explicitly in terms of *body* and *motility*.

Taking the primacy of moving/touching as radically as possible, perception, knowing, living must be understood as dynamic processes first rather than as the aspects or effects of processes subsequently considered. In other words, we can’t take the process away from living, perceiving, knowing in order to hold it still that we might analyze, grasp, document it. We must not take the living out of life. Even though there can be a certain vitalizing effect in doing so, we are too often satisfied with artificial constructs that take us away from what is most interesting: vitality, the force of living. Our accumulated experience has come to be powerfully shaped by the practice of understanding our living bodies and our cultural and environmental lives by eliminating the dynamic processes through the application of certain retrograde backfilling analytic and language methods. This approach, now naturalized for us, is in part a product of our culture and history.

Comment [Office19]: maybe just drop this paragraph or switch it with the second one about Zombies.

This need for a reminder to keep the living in life is an odd concern, now isn’t it? It is indisputable that we are at every moment living moving animate creatures; how can we not be? What is implied by the need for such a reminder and by the seeming difficulty of carrying out the implications of this reminder is that we have somehow managed to at least make the effort to squish the living out of life as we seek to study and understand it; too often *autopsy* trumps *kinetics*. The image that comes to my mind that allows us to retain some sense that we are living even as we have lost our full vitality is zombie scholarship, the pursuit by the living dead threatening to consume (feed off of) the living living. This image has further traction when we think of one of the marked distinctions of zombies; isn’t it their incoherent lurching yet oddly machinelike movement and the absence of body dynamics as well as their outstretched groping fingers? Zombies are animate beings with very poor coordination dynamics; they are not smooth movers, yet their self-movement, staggering and pitching about, is their threat and their own odd vitality, the “living” part of

the “living dead.” Zombies seek to grasp, to hold, to clutch and in doing so to eat, consume, devour in the crudest fashion taking the life out of their prey. And interestingly when Zombies manage to get hold of their subject, colonists as they are, they inevitably turn their subjects into Zombies as well. Their subjects become like them; lurching empty shells of their former selves. The result is that all things, like all Zombies, become more or less the same. Zombie is a proper candidate for the poster figure for traditional academics and objectivist modes of understanding.

By focusing our attention on movement, self-movement, interpreted as radically as we can manage, our attention is directed to appreciate process rather than the immovable truth. Still, process cannot be just process. Process has to process something. While we can consider the intensity and force of life in terms of processing; surely the richness and quality and depth and lushness of living requires specificity, content, substance, stuff, action, context. Life without material content is mere process, empty flow. There is the tendency to lose one or the other simply as we attempt to focus or grasp. The notion of copresence that might also be termed metastability, reminds us that neither aspect of movement/life is possible without the other. To focus on either matter or movement without considering them as copresent is to get a partial perspective at best, to yield to our inner zombie.

What is essential is to begin to connect with the processes, the dynamics, and how they engage content and substance that implicate (or entwine) neurology, physiology, history, psychology, and environment in the ongoing processes of living. These constituents are at once subsystems that may be independently investigated by scientific specialists and contemplated by philosophers and yet these seemingly disparate subsystems are also copresent with one another as essential constituents of the animate living organism. Although I understand that to make the effort to retain a sense of what is known by treating each subsystem independently as well as to account for the dynamics of their twings is a reach for anyone, I must attempt to do so anyway simply because I cannot but think in these terms. And I have come to appreciate that any errors and shortcomings of my effort (and they seem inevitable) are more acceptable than are the alternatives any of which, I believe, amounts to a truncation and reduction that would expressly fail to make the effort to aspire to those ideas I believe most fundamental. I accept the inevitability of a certain amount of lurching.

My grasping process must recognize the primacy of moving/touching. Remarkably moving/touching is inseparable from felt experience, from perceiving and knowing, from connection with self and other, from the entwining of body and environment. The moving/touching primacy comprises a skill base for perceiving/knowing. Experience is felt in the presence of the moment as well as in the accumulation of its occurrence over time. An account of these processes then demands the inclusion of the entwinings of neurology, biology, body—all essential to living animate organisms—thus, if slightly redundant, *neurobiological*. It must include history and process both in the sense of immediate occurrence, *experience*, as well as the accumulation of these occurrences, thus also *experience*. And all of these constituents must be considered in terms of how they entwine constantly morphing and emerging in service to the constantly skilled and skill-developing life, thus *ensemblings*, similar to what Gerald Edelman calls “neuronal groups”

and Berkeley neuroscientist Walter J. Freeman calls “nerve cell assemblies”¹⁵⁹ and Esther Thelen and Linda Smith occasionally refer to as “ensembles.”¹⁶⁰ I am choosing this perhaps awkward term for several reasons. The plural gerund form *ensemblings* is selected to help remind us that I believe we are always talking dynamic integrating entwining process. I am choosing this term because of its musical implications, as I will consider in greater detail in the chapter “Fat Present,” of dynamic qualities of resonance arising among separate vital elements like a musical ensemble. I am leaving it in plural form, where I can tolerate it (barely), simply because we have such a tendency to objectify and limit and I’m hoping that the plural will give us an s-kicking to foreground ongoing process.

Most importantly to me is to show that the multiplicity comprises an ongoing dynamic process, a process not different from living and perceiving and knowing. Yet, this process must account for the influence of history, culture, and individuality/psychology. A major motivation for attempting this accounting is that in my readings of the reports of others I typically feel that the intent is both too narrow and too reductive in the sense of explaining the whole away by articulating some aspects of but one part. I am much less interested in resolving anything than I am in appreciating (and I dare say celebrating) what is human, and how humans are like and unlike other animate organisms, yet what it is about humanity that is, and always will be, beyond my grasp.

The major point is that we are comprised of ongoing dynamic processes that are afferent/efferent self-adjusting complex **reentrant** constantly transforming networks; processes that establish dynamic templates and fluid memories that are essential to development and use of the skills of perceiving and knowing. Key is that this dynamic concept is based on understanding moving/touching in the most radical sense.

Self-movement is a general criterion for this endeavor for a couple of reasons. The way that I have attempted to develop an understanding of movement is in terms of the moving in itself—being in no place, a process of virtual distance and unquenchable desire—and movement as different from but also inseparable from reflective or backfilled measurance. While these aspects of movement are not the same, they comprise a copresent implication. The energetics of living or vitality—the “I am”—complemented with the somewhat distancing reflective articulation of living—the “I am doing” or the “what am I doing?”

What I want to develop (sketch) in this chapter must aspire to include both of these aspects of moving; it must investigate this copresence in the terms of the animate organism; it must attempt to reveal the dynamics, the two that are separate yet entwined or are one. Focusing on self-movement is the most important strategy for pointing toward a satisfying sketch.

Comment [S20]: And degenerate?

¹⁵⁹ Walter J. Freeman, “The Physiology of Perception,” *Scientific American*, 264 (78-85)1991, pp. 85.

¹⁶⁰ Thelen & Smith, 135-36.

Experience

Experience is one of those terms used loosely perhaps because it is so common,¹⁶¹ yet it deserves careful consideration. Fundamental to the consideration of movement is that self-moving is felt, it is proprioceived, or perhaps better it is kinesthetic thus indicating a felt awareness of movement.¹⁶² The living of life comes to our attention as experience, felt awareness however defined or vague. In the broadest sense of being aware of ourselves as sensing beings, often argued as an awareness that comes to us in some way other than the quotidian senses, has an ancient history as the “common sense,” sometimes called *coenaesthesia*.¹⁶³ Recently philosopher Evan Thompson discussed in some depth “the feeling of aliveness” and found it a concern of other philosophers.¹⁶⁴ In the more specific detailed sense, experience is the awareness, even a general one, of doing something or having something that affects us. Experience, in this sense, denotes a presentness, a felt sense of what is now; it is the present feeling of self-moving, the “now” in “I can do’s,” in the “I am doing.” It may be linked with intentionality and awareness, but it is arguably present even without these. We experience things like pain not of our intention and often only vaguely in our awareness. We experience the tension and movement of our quadriceps as we lift our leg, but typically we simply are aware of lifting our leg, or even more generally of stepping or walking. And so it is that we retain something of the experience of our doings, livings, even if we are not fully conscious or aware of them or every aspect of them. We know that we often reflect on what has already occurred and in doing so sometimes discovering aspects that we were not focally aware of when they occurred. This suggests that experience as it occurs as an aspect of the presence of living has a copresence of sensations (more or less raw) and constructions (*ensemblings*). We experience life. We experience specific events or actions or moments rather than a stream of raw sensation.

Experience in this “now” sense is, as neuroscientist Peter Tse puts it,

¹⁶¹ I have found it rather odd that few give much attention at all to experience and most that do don’t bother to discuss what experience is in any detail. One important exception is Peter Ulric Tse, *The Neural Basis of Free Will* (201?), especially pp. 193-95.

¹⁶² Notes for further consideration: Kinesthetic experience ... unfolding kinetic dynamic (SJ123) ... thus qualitative. Kinesthesia is Husserl’s term SJ196. (I need to understand kinesthesia in Husserl’s terms). Mvt creates experienced qualities (SJ125). I think kinesthesia amounts to the reentrant style construction of experiencing of qualities of movement. This takes place in central nervous system as well as in the proprioceptive and muscle systems (tonus is the background condition for the rise of kinesthesia). Felt unfolding dynamic quality SJ131. Foreshadows discussion of fat present. Kinesthesia is experience of movement ... can’t be ignored (considering sensorimotor program language adequate) discussed by SJ510-15. Two kinds of kinaesthesia: felt and perceived SJ 515. Kinesthetic experience has both inside and outside ... (copresent implication?)

¹⁶³ comments on hist of *coenaesthesia* ... Heller-Roazen

¹⁶⁴ Evan Thompson, *Mind and Life: Biology, Phenomenology, and the Science of Mind* (Cambridge, 2007). See also Sheets-Johnstone, *Primacy*, pp. 458-60 where she considers also Potcka and Husserl on the same issue.

not of the body in some direct, uninterpreted way. Rather experience is constructed on the basis of ambiguous, sparse, and noisy sensory inputs mediated by numerous preconscious operations, such as shape, color- and size-constancy operations, heuristics and implicit assumptions about the likely mapping between patterns of sensory activation and the objects and events in the world from which they presumably arise.¹⁶⁵

The clear implications of understanding experience as the encounter—a comparative and pattern recognition and forming process—of sensory data and some existing expectations and assumptions about the world are that experience is inseparable from perceiving—the specifics of the resulting encounter—and knowing—the content of the expectations and assumptions that are essential to the construction of experience. Thus, while this process of encounter constructs experience of “now,” it is clear that such a process is always dependent on the accumulation of prior “now” experiences in the construction of expectations and assumptions that can be thought of as comprised of memories and concepts and images among other neuronal groupings. Experience is then always a construction in two seeming timeframes—the discrete “now” and the accumulation of these discrete “nows” into some constantly enriching patterns of assumption and expectation and also often into a network of episodic memories related to discrete “nows.” Both are active in the present, yet they have different time markers. Another implication is that this comparative and pattern recognition process must hold copresent both raw sensory data along with the triggered or invoked possible patterns of assumption and expectation that are necessary for the comparative processes of pattern recognition. The necessity of copresence and the processes of comparison and pattern recognition suggest that the “now” is something other than the instant now, but is stretched into a brief duration or, as I will discuss in greater length in Chapter 8, a “fat present.” This duration (as brief as it may be in clock terms) is nonetheless the temporal domain in which we experience. One other implication is that there can be no first experience, yet we are not created with a full set of assumptions and expectations. The distinction yet copresence of both these modes of experience demand that we understand experience and also necessarily perceiving and knowing as always process, always ongoing. These modes of experience can be identified one as being present “now,” the other as being “past” although episodic memories of experience are time-stamped with some “past” markers. Still these are modes of experience that are distinct from one another, yet copresent. It is both the distinctness and the copresence that give rise to experience.

Experience (both aspects) and identity: B says mvt conjoins “entry into exteriority” and “ability for renewal” impetus for new mvt” BDD93 the cumulative aspect of experience is “inscription in duration” allows “intervention of memory” in recognition BDD103. Massumi discusses experience Parable14

Comment [SG21]: Flesh out here

Experience, therefore, must have a cumulative character, a historical depth or thickness. We refer to the cumulative and accumulating aspect and effect of specific types of experience in a phrase such as “in my experience” and quantitatively as “extensive experience.” In hiring for a job we look for someone “with experience” by which we mean

¹⁶⁵ Tse, 195.

someone whose “I can do” this job includes also “I have done” this job “over and over” in many varying circumstances. Portfolios and résumés attest to this accumulation of experience. Typically the more “I have done” (experience) the better; but not always. We refer to one with “considerable experience.” Even this cumulative notion of experience is not separable from “feeling,” from a “feeling kind of knowing” because, in this cumulative sense, experience is not something that one can easily articulate, often not at all, in terms of a qualitative narrative or set of principles. Perhaps this is why job applications often require letters of recommendation. Experience in this cumulative sense is confirmed by its artful application especially to the novel or unexpected. Thus experience is necessarily interconnected with both the individual and the novel. The airplane pilot is able to avoid the crash because of her considerable experience. Experience in this historical and cumulative sense is often documented in time periods (for example, ten years) or repetitions (for example, ten times climbing the mountain) or tested circumstances (been through three battles, battle tested), but its content is invariably amorphous fuzzy multi-dimensional messy; qualities that, rather than being detriments to its usefulness and significance, are the very advantages that make it important, useful, and valued. Experience can be attached to specific action or content—flying, climbing, plumbing, combat—or it can remain relative abstract indicating enduring the passage of time. It is the non-reductive quality of experience in this cumulative sense that is the basis of its strength. The content and the how of specific experiences are themselves largely subjective—a body in motion feeling—with details remaining inaccessible. We don’t feel the pain of others. We don’t experience the feeling of another’s loss or gain. We can’t directly experience the accumulated experience of others.

Experience in the cumulative sense is akin to skill in several senses. Experience as kinesthetic and coenaesthetic is inseparable from movement and repetition. It is comprised of a set of repeated self-movements connected somehow with one another that leads to the refining and developing skill, often generalized. The skill is comprised of memory, history, variety, assumptions, expectations, and knowledge ensembled with a readiness for action that invariably includes perception and inquiry. This ensembled skill set is perhaps most easily understood in terms of musical/artistic and athletic examples. We know that to learn to play music or a sport we must practice. Practice is the repetition of an action usually under the scrutiny of critical awareness and guidance. I rather appreciate the often-cited rule of thumb that 10,000 hours focused practice are needed to gain skilled expertise. As musicians play an instrument or athletes play a sport, they experience the participation and action in the present, yet their performance and the quality of their experience is in measure linked to the extent of their experience (cumulative) and further their experience (cumulative) is enriched and enhanced with each “now” experience (contemporary or present). Perhaps the core distinction between skill and experience is that skill tends more to be relevant to repetitive actions purposefully directed toward the acquisition of improvement in that action; it typically indicates occurring under that gaze of criticism.

A common scientific procedure that demonstrates the neuroplastic aspects of cumulative experience is grounded in the shift in brain mappings to physical motion that occurs when fingers are either fused or deafferented (amputated or the nerve connection severed). Among the most commonly cited of these studies conducted by University of California

Comment [S22]: In some recent book I know the origin of this measure ... cite it here.

neuroscientist Michael M. Merzenich and his research group.¹⁶⁶ They show that the brain areas that map to these fingers are altered over time with the adjusted use of the digits involved. If fingers function together because they are physically fused the separate brain areas corresponding with the two separately functioning fingers merge. And the result of the deafferented finger is that the brain area associated with the finger no longer active is broached and occupied over time by the expanded maps of the remaining adjacent fingers. Another procedure that is in this set is the effect on brain areas that is the result of extensive repetition of stimulation to specific digits resulting in greatly enlarging the associated areas of the brain. As Merzenich described the importance of these studies, *“the specific details of cortical ‘representations’—of the distributed, selective responses of cortical neurons—are established and are continually modeled BY OUR EXPERIENCES throughout life.”*¹⁶⁷ This example is restricted to the rather one-to-one homunculus-to-body-part correlation and I consider it therefore, despite its remarkable complexity, among the simplest of the plasticities related to experience, but it does demonstrate at this clearest physical level that the nervous system accumulates experience in actual physical changes in the brain through repetition of patterns of “now” experiences. I am suggesting that this process occurs in similar, if much more complicated, ways for the interconnection of all “now” experience all of which have corresponding “accumulated” experience. Such actual changes in the nervous system involve synaptic criteria as well as reentrant networks deeply engaged in coordination dynamics. And I’m suggesting that this is a process that might well be understood in terms of skill development that includes a constant stream of perception and a constant accumulation of knowledge.

Merzenich’s focus on specific locations in the brain that correlate with movement and experience is nicely complemented by the studies of Walter J. Freeman and his research group at Berkeley. Rather than mapping the connection between specific neurons and the location of some action, Freeman was interested in the cooperative behavior of huge numbers of neurons dispersed throughout the brain. His studies were developed based on findings from his studies of olfaction in rabbits. He simultaneously measured by means of electroencephalograms (EEGs) the effect on a large number of areas on the olfactory bulb of rabbits as they inhaled and exhaled specific odors. The results of his studies, as summarized by Thelen and Smith, are “that the identity of an odorant was carried not in any single neuron or group of neurons, nor even in the shape of the EEG waves, but in the spatial pattern of the amplitude of the waves across the entire olfactory bulb.” Thelen and Smith see this finding as evidence of perception acting as a dynamic system. The spatial map associated with each familiar smell is organized not just in response to that one odor itself; the rabbit’s training and arousal state also impact it. So when a rabbit conditioned to one smell is introduced to another smell, the EEG maps for each smell are affected. Thelen and Smith argue that these results mean that an odorant “is represented in the bulb not as a fixed structure or schema but as a dynamic assembly that is always a function of global activity.”¹⁶⁸ Experience with one smell influences the future experience of other smells. According to Thelen and Smith, Freeman indeed postulated “that groups of mutually

¹⁶⁶ Cite Marzenich’s work ... reported in Doidge and elsewhere.

¹⁶⁷ Merzenich et al (1990) (ital. and caps in original) taken from Thelen and Smith p. 138.

¹⁶⁸ Thelen and Smith, 132.

excited neurons he calls the *nerve cell assembly* participate in the global pattern and are such a repository of past association.”¹⁶⁹ I will later suggest that we refer to such broad association of nerve cells as “ensemblings” and, as Thelen and Smith note (they too are deeply influenced by Gerald Edelman), Freeman’s “nerve cell assembly” is similar to Edelman’s “neuronal groups.” What is essential here, building on Merzenich’s work, is that perception and experience are dependent on broad dynamic systems that are interconnected while being physically separate one from another and that all are influenced by the history of experience, accumulated experience in the form of nerve cell assemblies or groupings (or ensemblings) that are global as well as local. Experience is cumulative but it is also associational and relational. The cumulative aspect or experience is inseparable from, copresent with, the constructed sense of the “now” experience.

I want to briefly consider another specific example to help illustrate and clarify the way I understand experience. In learning to dance, say social dancing, many dancers commonly experience that if they know one dance, say swing, it is easier for them to acquire the skills of a second dance, say salsa. Even though these dances (comparable to two different smells, orange and banana) are distinct, when they occur together, they engage muscles, rhythms, memories and all the biological systems involved in dancing. The patterns of each dance are distinct to the specific dance, yet they also participate in a global pattern and relate the experience of either one to the other. We must understand experience in terms of complex interacting dynamic self-adjusting systems. We must appreciate the importance of accumulating experience in its increasing contribution to both global and local pattern formation and use.

Thelen and Smith realize that comprehending dynamic systems

explains both the global order and the local details. The global order and the local variability are the same thing; they are inextricably tied together in a way that confers a special status on context—on the role of the immediate here and now. Context—the here and now—matters in three ways. First, context makes the global order. The global order is a history of perceiving and acting in specific contexts; it is through repeated here-and-now experiences that the global order is developed. Second, context selects the global order such that we can perform qualitatively different acts. For example, depending on the terrain, we can sometimes walk, sometimes slide, and sometimes stand still. Third, context adapts the global order; it fits the history of past here and nows to the task at hand. Context makes, selects, and adapts knowledge in our dynamic systems theory because knowledge is only made manifest in a real-time task. The global order is the pattern of the real-time activity of time-locked and reentrant systems—a pattern of activity that includes the sensory input of the moment, the preceding activity, and the history of activity. Since global order is made by and made manifest in the details of the here and now, it is most fundamentally always context-dependent.¹⁷⁰

Experience (cumulative or global) is related to knowledge, yet has as much or more a sense of knowledge digested in advancing skill and ability than in some quantity of facts or

¹⁶⁹ Thelen and Smith, 132.

¹⁷⁰ Thelen and Smith, p. 216.

delimited information. An understanding of knowing as more aligned with accumulated experience than with accumulated information is a core principle of evaluation of education and pedagogy; yet, increasingly even higher educational institutions are equating education with information. A major question is whether all knowing is grounded in moving/touching experience. I believe it is, as do others such as Maxine Sheets-Johnstone, Mark Johnson, George Lakoff, and Esther Thelen and Linda Smith. I'll consider this issue further in the chapter "Perceiving and Knowing." Experience is that feeling kind of knowing that is not separate from information and facts, but is more interwoven, applicable, useful, and qualitative. When we are asked a question about some topic we know something about, we often pause briefly (sometimes using the word "well" or "so" or a sound "uh") to allow time¹⁷¹ for the generation of a feeling kind of knowing associated with our experience. Once we have gained contact with that feeling of our knowing, we feel able to begin speaking (a feeling of potential coherence or coherence potential to parallel action potential) even if we have only a vague sense (iconic, I'd suggest) of where we're going in our response (linear because of the nature of speech). The quotidian and invariability of the feeling access to experience offers, I believe, some experiential clues into the ensemblings process I am beginning to discuss.

Experience is related to aesthetics as well. As experience accumulates the performance of skilled self-movement or living movement is often linked with increasing artfulness. Experience accumulates into mastery and mastery often manifests as effortlessness, ease, *sprezzatura*, beauty. This remarkable connection of beauty with the ease of experience is based I believe in the smoothness of movement that we all occasionally experience, at least in some respects. The raw sensation or the occasion of thought invariably triggers a number of possible actions and it also offers a variety of sequences of chained actions. It must be argued that the choice among these possible courses of actions is based on the accumulated experience that has been shaped by past repetitions in a gradient of efficiency and successful and pleasurable actions. If for example one possible course of action is associated with erratic jarring or impossible action, it will not be selected when another possible course of action is associated with efficiency and smoothness; such actions are often experienced as pleasurable and as beautiful. I'll consider this topic more fully in the chapter "Coherence."

The questions then are: what in biological terms constitutes experience? Where does experience reside as part of a human being? How do new experiences get attached to prior experiences in the building or accumulation of experience? And how is experience activated and used and applied to exigent and novel situations? Minimally we must see that there is a constant and complex stream, actually streams, of input acquired through sensory and proprioceptive means that are constructed into experience through the

¹⁷¹ This tiny time interval is what I call "Fat Present" and is not empty, but, as Massumi says, "overfull" because it is the interval engaged in the dynamic ensemblings processes. Even though we might equate this interval with the phrase "let me think about it," it is not some linear rational objective process but rather a dynamic feeling process that we can be aware of taking place but rarely can we do more than catch hints of the vast parallel dynamic processes that are involved. We only experience a resulting feeling of "coherence" (see chapter "Coherence") that gives us permission to start responding.

encounter with our history of or accumulation of similar and related experiences somehow retained and coordinated and ensembled in terms of the needs of the ongoing experience. Experience, thus understood, is a magnificent and essential and seemingly impossibly complex dynamic of coordination. Experience is inseparable from the coordination dynamics that enable coherent perception of the world rather than a recording of streams of unrelated raw sensation. Neuroscientists and biologists and psychologists and mathematicians have begun to show in some detail how these coordination dynamics, these neuronal groupings, these experiential ensemblings work.

Experience is often subdivided into types such as physical, mental, mystical, religious. Kant and others opposed experience to reason. In my understanding such subdivisions as well as limitations on experience are a result of the cultural, historical, and psychological influences on the criteria that determine ensemblings and groupings rather than being based on ontological distinctions.

Biology & Coordination Dynamics

The issues of coordination most impress me as I attempted to contemplate even the possibility of smooth or effective living movement. I'm referring to both the simplest of our daily tasks such as reaching for a coffee cup and drinking from the cup as well as to those self-movement accomplishments of unbelievable complexity as demonstrated routinely by dancers and gymnasts and athletes and musicians and surgeons.

The articulation of this issue of coordination first emerged for me as related to neurotransmission speeds. While thinking about the misleading aspects of describing neurology on the model of electronic wiring I compared neurotransmission speeds with speeds of electricity. Two things emerged for me. First, neurotransmission speeds vary enormously based on almost infinite variables. Second, even at their fastest neurotransmission speeds are slow enough for these variables to seem to me to be a concern. The fastest neurotransmission speeds are still three million times slower¹⁷² than the speed of electricity at which speed variations in the mechanics of the human organism would not be relevant.¹⁷³ I began to imagine that the musculoskeletal aspect of movement depends on information that must come through many different pathways at widely varying speeds, yet the smooth execution of complex movement that we animate organisms are all routinely capable of surely cannot tolerate much variation. Further, not only is it brain or cord to muscle coordination, it also involves many other organic systems that are themselves shaped by experience and environment. I'm convinced there is no

¹⁷² Based on neurotransmission speeds of 200-250 miles per hour compared with electricity moving at something like the speed of light.

¹⁷³ I'm convinced that I'm correct here. At the speed of light response time would not be relevant for biology. Yet, saying so raises for me some provocative questions about when such speeds do become relevant. For example, I know that with the implementation of computer-based electronic stock trading that differences in the length of transmission lines gave some traders an advantage over others. There are questions of scale and kind here that are amazingly interesting, yet are clearly outside anything I'm doing here other than footnotes. Thanks to footnotes for allowing me a chance to at least try to state the issue.

Comment [SG23]: a.Experience: maybe an account of experience as copresent implication: experience implies both immediate, felt, action process as well as an accumulation, a constant revision, supplementation, enrichment. It is a key concept in understanding perception as skill-based: as the accumulation of skill as well as the use of skill to effect the world. S-J 167. Husserl on unity of object ... my notion of "ensemble" rather than synthesis ... and then develop the neurophysiological basis for this in proprioception as well as in neuron actions. See also notes of S-J around p. 258.

Comment [SG24]: Bit awkward and incomplete. This is where I need to reemphasize the copresent implication thingy.

master controller or clock in animate organisms. Yet, short of such a master, the coordination of the organism dynamics must simply pervade the organism, that is, coordination must be organic and emerge across the system as it functions dynamically. Coordination dynamics seemingly has to be an essential aspect of self-moving. Self-moving is inseparable from coordination dynamics. I'm fully aware that my motivation to appreciate coordination dynamics in terms of transmission/action potential speeds is not what has given rise to the study of coordination dynamics in many fields; such speed variation is but one of many of the complex factors that demand coordination.

Internuncial Network

One of the most important clues in attempting to understand coordination dynamics in the nervous systems is to learn about what Deane Juhan refers to as the Internuncial Net.¹⁷⁴ Comprising as much as 90% of all neurons are those that are intermediary to sensorimotor efferent "commands" and the connection with muscle cells that initiate movement. Of the estimated ten billion neurons each with large numbers (as in a thousand) of axon branches and dendrites, the complexity of the network is almost (why do we think we can even use the term "almost"?) beyond comprehension. Realizing then that 90% of all neurons are not directly—seen as point of origin stimulus and point of termination response—involved with the specific afferent/efferent communication between nervous system and musculoskeletal systems suggested to me that all these neurons are not just lazing about awaiting some job to do. Their constant activity (and it is known that they are almost constantly active) is not just noise. Rather they are madly at work putting things together for the demands of the ongoing functioning self-moving organism. Functional MRI scans, considered before the usual subtractions that isolates specific changes, show that the whole brain is constantly at work; even the brain seemingly at rest is known to consume considerable energy. What else could it be doing other than the brain communicating within itself in terms of all the variables and all of the generalized ongoing tasks necessary? These neurotransmissions have to constitute a massive and constantly ongoing process of coordination that gives rise to ensemblings or neuronal groupings necessary for the performance of skilled movement (all of our movement really), the accumulation and processing of the information gained (experience) through the performance of these skilled movements which in the terms of other frames of reference amount to perception, conception, memory, thought, intention (the whole array of cognition) coordinated with all of the ongoing biological functions that also have to be maintained and coordinated. And there is no single area or function that can be designated as "in charge" of all this. If anything is in charge it is "living movement." The startling thing is that almost all of this complexity is devoted to the nuancing of coordination and the transmission of afferent/efferent signaling that incorporates skill and memory and experience as well as all of the variables of the living organism. Along these endless pathways are neurons that interpret and select signals in transit in both directions. It is among this network that, as

¹⁷⁴ I believe that this terminology is not common among neuroscientists. I have rarely found it outside of Juhan. I am however retaining its use here because it helps remind us of the complex reticulated reentrant functions that I believe engage the bulk of neuronal activity.

Juhan puts it, all our “tone levels, reflexes, gestures, habits, tendencies, feelings, attitudes, postures, styles have their genesis.”¹⁷⁵

Juhan’s term “Internuncial” is an apt one to describe this commonly overlooked but vital and pervasive brain activity. In the Roman church the internuncio are the papal ambassadors or more generically the messengers, agents, or go-betweens. I like the image of these messengers as I imagine them particularly in pre-print history when they carried messages back and forth between the church leaders and the laity living in villages. We imagine the internuncios travelling from village to village, chatting and exchanging information. With no written record one can imagine that such a process of communication could only lead to the constant shifting and blending of messages going both directions by the succession of conversations and responses—gossip. The internuncios were messengers in social media self-adjusting networks that probably worked not unlike contemporary electronic digital social media or like the coordination dynamics in the neurological internuncial network. We can also see that when we think of the church comprised of this vast complex system it might best be understood as a complex self-adjusting dynamic network, a dynamically coordinated moving body, rather than as a collection of laws and doctrine.

The point of central importance is that a system as diverse and remarkably complex as an animate organism in terms of the accomplishment of the most basic organic functions requires a system of immense complexity and sophistication to accomplish self-coordination. It is little wonder then that this internuncial network, comprising the bulk of the neurons in the nervous system, is constantly abuzz with these activities.

Reentrance

Among neuroscientists there have been broad competing theories of how the brain works although the brain is so complex that the goal of full comprehension remains largely out of reach and the theories will be long and constantly debated. Many of the current approaches propose either holistic integration or reductionist segregation theories. Nobel Laureate biologist Gerald Edelman’s 2006 book *Second Nature* presents¹⁷⁶ a view of the brain that seems to allow aspects of both of these approaches. He held that the brain is a system designed for selection¹⁷⁷ and for pattern recognition.¹⁷⁸ His system has three tenets. The first is that the process of continual selection leads to “enormous microscopic anatomical variation” over time. Here coordination dynamics are acknowledged by the recognition that neurons widely separated from one another become coordinated through

¹⁷⁵ (Juhan, 163).

¹⁷⁶ This book summarizes for a general reader the more technical discussions of this “theory of neuronal group selection” (TNGS) described in ??? (2 books).

¹⁷⁷ Edelman calls this “neural Darwinism” a term he introduced in 1997. In ???. And he has received some criticism for the implications of this term. In my reading of his work he is inspired by the criteria of selection being made ultimately on the necessities for survival and I understand his use of this term as being primarily to indicate the significance of the selections taking place in brain functionings.

¹⁷⁸ Thelen and Smith, inspired by Edelman, also seem to include both as they see the local and global as necessarily complementary.

the process of repeated selection together (time-locked). Their synapses correlate in the formation of what I'm calling ensemblings by some principle of coordination often described by the phrase "neurons that fire together wire together."¹⁷⁹

Edelman describes his second tenet this way:

an additional and overlapping set of selective events occurs when the repertoire of anatomical circuits that are formed receives signals because of an animal's behavior or experience. This experiential selection occurs through changes in the strength of the synapses that already exist in the brain anatomy. Some synapses are strengthened and some are weakened The resultant combinations of signal paths that can be followed in the brain are vast in number, as are the neuronal groups that constitute the selected elements.¹⁸⁰

Edelman is referring to something very different than the identification of a particular homunculus, a specific local region that "controls" behavior in a corresponding body part. Rather he is articulating the functional characteristics of the pervasive and vast internuncial network of neurons that communicate what is occurring throughout the brain and whole nervous system. Notably he implicates experience as fundamental to the ongoing shaping that occurs in this process. As the brain is engaged in the performance of certain functions of the whole organism the brain is itself changed by these selection processes so that there is an increase or decrease in the likely coordination of synapses that exist at a distance from one another. So the brain's specific functioning changes in relation to its own ongoing processing; this is extremely important. But Edelman also includes the shaping of the brain and its processes of selection related to the behavior and experience of the whole animate organism. The brain is inseparable from experience in both temporal senses of the demands of the current happening and the cumulative conditioning of repeated behavior, both internally and in conjunction with the whole organism self-moving in its environment.

Particularly challenging the popular reductionist segregationist view of the brain, Edelman's perspective raises the questions of how neurons at a distance from one another "know" to "fire together." What is the mechanism of communication and coordination? This issue, a magnificent one really, is the issue of coherence that I'll devote a chapter to later on. Edelman asks, "how do we get *coherent* behavior out of the system?"¹⁸¹ And this demands Edelman's third tenant that is a process he refers to as "reentry." The term reentrant means "inward" and Edelman describes the process this way.

Reentry is the continual signaling from one brain region (or map) to another and back again across massively parallel fibers (axons) that are known to be omnipresent in higher brains. Reentrant signal paths constantly change with the speed of thought.

¹⁷⁹ Edelman, *Second Nature*, 28.

¹⁸⁰ Edelman, *Second Nature*, 28.

¹⁸¹ Edelman 28.

The net effect of this reentrant traffic is the time-locked or synchronized firing of neuronal groups in particular circuits.¹⁸²

“Degeneracy,” as Edelman uses the term, correlates with reentrance. Degeneracy refers to the capacity of the nervous system wherein any single function can be carried out by more than one configuration of neuronal networks. Degeneracy also includes the notion that the same neurons can be bound up in a variety of different neuronal networks associated with different functions. Physically degeneracy is represented by the complex branching of neuronal connections that are one-to-many and many-to-one and both afferent and efferent. For Edelman, degeneracy is at the core of the flexibility and adaptability of the nervous system. It is how groups of neurons can interconnect with others in finite combinatorial configurations. Degeneracy is not “redundancy” as in electronic wiring, which simply means that should one system fail another will take over. Rather degeneracy is the very notion that can never be represented in terms of electrical wiring; it is that capacity for groups of neurons to interconnect in part or whole with other groups in such a way that they modify one another in their connecting. The ongoing organic development of the nervous system is enabled through degeneracy, as is the freedom of the nervous system to adapt itself to external exigent demands. Degeneracy is reentrance from the perspective of charting connections; together they enable metastability and nonlinearity. As a great many things must be happening in parallel, yet in connection and coordination with one another, degeneracy and reentrance are how Edelman understands these processes taking place with coherence; coherence that arises from the dynamics of the complex system itself, rather than from some control center.

Edelman’s understanding of reentrance and degeneracy provides us with a neurological understanding of the identity or copresence of “now” experience and “cumulative” experience; how banana and orange are interconnected as smells; how swing and salsa draw on the same dance skills.

Edelman understands these three tenets as comprising a “theory of neuronal group selection” (my emerging “experiential neurobiological ensemblings”) and it begins to help us appreciate Juhan’s global statement that our “tone levels, reflexes, gestures, habits, tendencies, feelings, attitudes, postures, styles have their genesis” in the processes of the internuncial network, a complex self-adjusting reentrant network. We may also imagine that memories, images, concepts, schemas, skills, behaviors all are shaped and become present to us through this complex selection and coordination process. This reentrant degenerate selection process, always evolving and changing and constantly reshaping its selections based on external needs, helps us glimpse through the thick veil of overwhelming complexity to gain some hint of how coordination and coherence are possible at least within the universe of the nervous system.

We might call it “gossip.”¹⁸³ They (neurons) are involved in the endless chatting about what all the others (neurons) are up to seemingly capable of somehow relating everything to any scrap of information. And we well know the social force of gossip.

¹⁸² Edelman, *Second Nature*, 28-29

Coordination Dynamics: The Twinkling Metastable Regime

While we may now imagine an incomprehensible system of interconnection among all of the various regions of the brain and recognize that while we describe them in terms of wiring diagrams they are far more fluid and variable and complex and dynamic and organic, we have begun to accumulate hints, smudgy ideas really, about how, even without some master clock or controller, a network of such complexity can be self-adjusting, self-coordinating. Yet, the craziest unassailable “fact” established by our own experience, is that somehow indeed it does work. We know it does because we exist; we seem to work fairly well as animate organisms. Of course, this “fairly well” is an “iffy” term, yet I believe that it can take on considerable precision in terms of coherence and smooth movement (see chapter “Coherence”).

I have repeatedly mentioned “coordination dynamics” without offering a broader understanding of what it is and how its study has come about. I’ll do that now. Over the last quarter century a new field of study, coordination dynamics, has developed with parallel efforts in theoretical physics, physical chemistry, neuroscience, mathematics, theoretical biology, developmental psychology, and kinesiology.¹⁸⁴ The impetus for such a field of study is in part the seemingly impossible problems quantum mechanics presented by acknowledging that light is both particles and waves. Logically these are mutually exclusive, yet there they are both inseparable and yet separable. Coordination dynamics are also called for in systems of great complexity where it is clear both that there is coordination, yet also that it is not clear how that coordination occurs. Examples are schools of fish, flocks of birds, and, of course, neurobiological functions (neurons at a distance communicating so as to “fire together”).

J. A. Scott Kelso and David A. Engstrøm suggest “the hottest topic of the twenty-first century is going to be the problem of coordination—from molecules to macromolecules to organs, from individual human brains all the way to economics, societies, nations.”¹⁸⁵ Certainly as we increasingly build vast networks and recognize the common existence of so many others and as we gain the courage to realize that simple cause/effect linear models are far from adequate to explain how these work, we will have no choice but to acknowledge that there is no “way to avoid the problem of coordination and still understand the physical basis of life.”¹⁸⁶ I also can’t help but (in writing these words I share in the reluctance I’m identifying) think that such a perspective must amount to something of a revolution in the

¹⁸³ Sorry, I know that just as I turn to the “hard science stuff” I veer off to this strange observation. Yet, as I read lots of neuroscientists who attempt to describe what is taking place in the brain, they often use familiar analogies to assist in making the point. Furthermore, I really like the implications of the word “gossip” for this use. It is well known that actual gossip occurs within complex self-adjusting network systems that might well be comprehended only with the aid of sophisticated analysis of coordination dynamics.

¹⁸⁴ See Kelso and Engstrøm for a detailed overview of the contributors representing these various fields, 88-89.

¹⁸⁵ Kelso and Engstrøm 85.

¹⁸⁶ Howard Pattee, a conceptual biologist, quoted by Kelso and Engstrøm, 85.

way we understand the world socially and religiously and politically. We are accustomed to creators and leaders; we expect there to be a master clock (including a “beginning,” *in illo tempore*) and a world center (*axis mundi*) and someone in charge (God) and we expect that there must always be a cause including a first cause. Yet these master/commander/god expectations are found to be only illusory in a self-adjusting vast network in which coordination dynamics arise from nonlinear organic relationships involving variables that influence the system producing them. Fearfully we may think of the hive or the flock or the herd; alternately we may think of the marvel of human biology. It is the sheer inevitability (or I suppose eventual undeniability) of self-adjusting vastly complex networks that makes coming to some comprehension of coordination dynamics essential to the twenty-first century.

In the broad terms of brain theories, how can there be both very specific locations in the brain associated with very specific actions (*homunculus*) and at once coordination among so many and complex parts as is evident by coherent and smooth movement performed the whole organism in the context of highly varying environments? The work of J. A. Scott Kelso on coordination dynamics as presented in his 1995 book *Dynamic Patterns: The Self-Organization of Brain and Behavior* establishes a broad and important scientifically based understanding of how coordination dynamics work or, to me most essentially, that coordination of such a complex and seemingly impossible system is even remotely possible to describe. The issue that is so difficult to comprehend is how a network as complex and diffuse and internally varying as the internuncial network, as the entire brain, as the entire animate organism, as the animate organism set in a complex environment can, through processes of reentrance and degeneracy, that is, by means of a system wildly communicating among its parts, somehow self-organize into coherent or smooth action. More recently, collaborating with David A. Engstrøm, Kelso returns to update his work on coordination dynamics and apply it to the observed tendency, seemingly universal, to organize the world in terms of pairs or dyads. Their 2008 book *The Complementary Nature* also serves well to provide a sense of the potential general applicability and importance of this vastly complex and most often highly technical study conducted by so many specialists in their own terms. The book also articulates a unified brain theory without dismissing either the holistic integration and reductionist segregation theories. They write,

Up to now, brain research has predominantly considered holistic integration and reductionist segregation—its two prize, competing theories—as *contraries*.

Likewise, the study of how the brain perceives the world is still wrapped up in the empiricism versus nativism debate of philosophy, though now couched in the more contemporary engineering terms of feedback (from the senses) or feed forward (due to the brain’s own intrinsic activity). In coordination dynamics, not only have we found a way to ground the study of complementary pairs in science, but complementary pairs seem to help advance the very science that explains them.¹⁸⁷

In 1994, the year before Kelso’s book, Esther Thelen and Linda B. Smith published *A Dynamic Systems Approach to the Development of Cognition and Action*. Kelso does not refer to this work, but it offers a powerful complement to his work. Perhaps because it is

¹⁸⁷ Kelso & Engstrøm, 178.

focused primarily on examples of development in early childhood, the broader implications of this book have not been fully appreciated. Before returning to Kelso and especially his more recent work with Engström, I want to discuss the important insights of Thelen and Smith.

[Thelen and Smith]

Coordination dynamics speaks to my concerns with moving and touching; the insights related to coordination dynamics amount to a scientifically based discussion/explanation of what I have been considering in the terms of “copresence.” Even a brief and admittedly far too simplistic sense of what Kelso has done will show how biological coordination dynamics are deeply involved in self-movement and vice versa. This work helps demonstrate that my discussions centering on the architectures of neurons and proprioceptors and body (particularly human, but all animate bodies) were not simply fascinating but contrived exemplifications of some made-up principle (the bane of the humanities and philosophy!) but that they are grounded in biology and the operative coordination can be mathematically modeled. It is interesting how science trumps philosophy no matter how you approach it and it is interesting to me that no matter how much Kelso wants to claim that he sees them as equal he clearly and persistently grounds himself in science as the “real” as opposed to merely “metaphor,” the trope he understands as the trademark of philosophy. His weak treatment of the Humpty Principle is I find the main disappointing area of his discussion and, unfortunately, it colors much of his broader discussion, that is, the discussion beyond technical scientific description.

Although Kelso and Engström do not come to the issues of coordination dynamics in a way anything like the rather autobiographical approach I have taken here, they clearly rely on the existence of a vast self-organizing network and this reliance implies what Edelman refers to as reentrance (Kelso and Engström acknowledge him). In *The Complementary Nature*, Kelso and Engström provide an extensive, yet fairly layperson accessible, discussion of how this self-organization occurs.¹⁸⁸

[Perhaps a general overview of coordination dynamics via Kelso and E: “twinkling metastable mind”; new concept of brain .. copresent implication]

One of the key terms of coordination dynamics is “metastability;” meta from the Greek “after” or “beyond,” with the intent here towards “beyond.” Kelso and Engström describe metastability this way.

Comment [SG25]: Unclear whether I need do this here at all. May have enough from then added in since I first wrote this.

Comment [SG26]: What I want to do here is to review their way of comprehending dynamics and the implications for perceiving and knowing. They are concerned with movement yet don't quite see its radical primacy ... that needs to be said as well. I also need to add a section on them in Perceiving and Knowing.

Comment [SG27]: Integrate this phrase in somewhere near the end of this section.

¹⁸⁸ I encourage anyone interested in coordination dynamics to study both of Kelso's books. Coordination dynamics are complex. Kelso makes an effort to present coordination dynamics in a way that most of us non-specialists can comprehend; yet it still takes up a good hundred pages of fairly dense reading. While I certainly can't replicate that here, I simply want to present basic terms that give what to me amount to a sense of the most important aspects of coordination dynamics. There are risks of course; the risks of a non-specialist interpreting and understanding a field of great complexity and breadth based solely on the work of a specialist written for non-specialists. Knowing this I still feel that it is far better to take a crack at this rather than to pretend that this doesn't exist.

Metastable coordination dynamics is an entirely new and different conception of how the brain works. Metastability says that individualistic tendencies for the diverse regions of the brain to express themselves as segregated entities *coexist* with collective, coordinated tendencies to bind and integrate as a functional unit. The metastable brain~mind implies that the patterns of the brain are fluid precisely because tendencies to bind coexist with tendencies to break apart. It implies that the patterns of the brain are diverse precisely because tendencies for the parts of the brain to cooperate coexist with tendencies for the parts to compete. In this view of the brain, the view of coordination dynamics and the complementary nature, apartness (segregation) and togetherness (integration) coexist as a complementary pair of tendencies. At the same time, opposing theories and pure states of integration versus segregation appear as polarized and idealized extremes.”¹⁸⁹

Recalling my discussion of the architecture of the single neuron, it is this very sense that neuron must be segregated from neuron for movement, action potential, to exist, to occur. The potential¹⁹⁰ is in the segregation, the separation. Yet, movement is impossible in an independent and isolated neuron; a neuron with no context is not possible. There must be synapse, a connection. More, there must be copresence. Movement is the implication, the entwining. Kelso’s and Engström’s theoretical and laboratory processes confirm that metastability or, in my terms, copresence is at the core of comprehending coordination dynamics. The passage just quoted is also key to comprehending how they are presenting a new understanding of the brain that does not reject or privilege either the holistic integrationist and reductionist segregationist theories. Both theories hold at **once**.

The end of the quoted passage however suggests implications that I do not believe are consistent with the findings of Kelso and Engström, yet they tend throughout their book to offer the same articulation. While they offer a strong statement of the coexistence of apartness and togetherness, it does not seem that they quite take this copresence in a radical sense, or as radical as I believe is required. They constantly use the language of “in between” and “reconciliation;” indeed, their whole book is organized in three “movements” (curious since they rarely acknowledge the importance of movement and the word “movement” is not an entry in their index) that first presents “philosophy” and then “science” and then “reconciliation.” As in this quoted passage they tend to see copresence as opposing polar positions (taken radically) and that they are engaged in the “interplay” in between. In their study of complementary pairs, their use of the tilde (~) rather than the slash to conjoin paired terms serves as a sign of their sense of interplay. To me their most profound and far-reaching discovery is the radical coexistence of apartness and togetherness that I understand to characterize their notion of “metastability.”

The play of metastability or play in any sense does not occur “between” but rather as copresence, as the two that is also simultaneously and impossibly the one. Play is the core

Comment [SG28]: Metastability is like resonating vessel, it is the two coexisting as one, or it is copresent implication. K & E use ballet image to illustrate (p. 149) Coordination dynamics produce and dissolve patterns ... by means similar to oscillating resonance

¹⁸⁹ Kelso and Engstrom, *The Complementary Nature*, p. 149 (ital. in orig). The use of the tilde in “brain~mind” is their way of signaling coexistence rather than exclusive opposition.

¹⁹⁰ I mean potential here in the physics sense. A simple notion is that the potential energy of an object increases as it is lifted from the floor. The potential is in the distance. An object on the floor has no potential energy.

energetics of metastability. Play exists in the impossible in which one thing is another that we know it cannot be. This fork full of food **is** a cho cho train. There is no between, only the virtual gap that what **is** is also **is not**. I suppose we might understand the language of “in between” as equivalent to “gap,” yet any “reconciliation” is a stabilization into “oneness” that most certainly would put the end to play. What is especially interesting to me in the metastability inherent to coordination dynamics is that it is not the reconciliation of two complementary values that is fundamental, as Kelso and Engstrøm seem to propose. Rather it is the irreconcilability, yet undeniable copresence, of these values that is the basis of the force of their interplay. Even the etymology of the term “reconcile” indicates “to bring back together.” This understanding is but the weaker half of the structurality of metastability. “Bring back together” must always be paired with “hold together what cannot be together.” It is in the copresence of the irreconcilable that play occurs. Reconciliation stops play and thus movement. Friedrich Schiller’s eighteenth century understanding of this play structurality (as also Derrida’s¹⁹¹ post-modern understanding) shows the recognition that metastability, copresence, must be taken radically, not as the condition of complementary polar positions inviting reconciliation. There is no “in between” but rather a “mingling,” to use Michel Serres’s term,¹⁹² or a twining.

Another mathematical principle that, for me, helps articulate the core components of Kelso and Engstrøm’s coordination dynamics is “nonlinearity.” This simply means that the outcomes are not precisely predictable from the beginning conditions. Nonlinearity suggests to me the looping that takes place in which, as a process is in progress, the very process loops onto itself to shape itself in ways unpredictable at an earlier point. Nonlinearity arises as well in that all processes occur in context and there is always the presence of the unexpected, the random, in this connection. Indeed, most importantly I believe, nonlinearity from its various sources is essential to life, to vitality. Should all processes be linear then all things are predictable and mechanistic. Descartes understanding of the body as mechanical is a body of linearity.

We live in a world that expects and is predicated on the assumption of linearity. However, Thelen and Smith summarize the Belousov-Zhabotinskii chemical reaction that seemingly produces the “spontaneous generation of elaborate patterns in space and in time from mixing some simple, inert chemicals.” In these patterns nothing about the nature of the chemicals can predict the outcome; the equations do not balance. It is in taking seriously this and other such examples in science that gives rise to a

new science that discards simple cause-and-effect models, linearity, determinism, and reductionist analysis. Instead, it is a science for systems with a history, systems that change over time, where novelty can be created, where the end-state is not coded anywhere, and where behavior at the macrolevel can, in principle, be reconciled with behavior at the microlevel.¹⁹³

Such a new science is concerned with dynamic systems with dynamic patterns with coordination dynamics, with systems that evolve based on their influences on themselves

¹⁹¹ Derrida on play. Add comment on how he rejects even the play/nonplay reconciliation.

¹⁹² Michel Serres, ??? Mingled Bodies???

¹⁹³ Thelen and Smith, p. 49.

based on their own history and on the unpredictability of their connection with the environment or context. Such systems are particularly appropriate to understanding animate beings and biological systems. Of special importance is that wherein linear systems have difficulty comprehending novelty and freedom in dynamic systems characterized by nonlinearity the degrees of freedom are very large.¹⁹⁴

Kelso and Engstrøm refer to nonlinearity in terms of their analysis of complementary pairs.

We offer an explanation of complementary pairs that is neither purely metaphorical nor purely quantum mechanical in origin. With its built-in, essential nonlinearity, coordination dynamics says that two opposing tendencies like integration and segregation are complementary and coexistent. An exhaustive account of how the brain works rests not on one or the other. Coordination dynamics shows it is a subtle interplay of both.¹⁹⁵

Nonlinearity fuels play; that's what characterizes it. While the typical scientific strategy to deal with nonlinearity is to propose an approximating linear function, we can see that this strategy of converting the nonlinear to the near-linear removes the play and the movement; it eliminates novelty and freedom; it does not take seriously the amazing insight of copresent implication; it is the approach of zombie academics.

Interestingly again Kelso and Engstrøm contrast the "purely metaphorical," which earlier they identify with philosophy, with the "purely quantum mechanical," which earlier they identify with science and the "real." While they acknowledge these as polar opposing positions separated by a tilde, what I find most interesting is that each of these "polar" positions is itself a copresence. Metaphor can be defined as "understanding one thing in terms of another thing *which it is not*." ARGUMENT IS WAR is a typical statement of metaphor and would be implicated in such terms as "she destroyed him in that embattled debate." Metaphor has its power not in reconciling "argument" and "war" but in the endless interplay that arises because, while we hold the two as copresent, as equal, as "is," we know they are not. If we removed either the "is" or the implied "is not" the trope would no longer be metaphor; it would collapse as either identity ($A = A$) or nonsense ($A \neq A$ because $A = B$). Similarly the issue of quantum mechanics is that light is wave and particle yet a wave is not a particle or comprised of particles. Yet it is in the evidence that light is wave and light is particle and wave is not particle that quantum mechanics has its profundity, its potential. The core idea of this book arises in recognizing the generative power of the radical irreconcilability of copresence as illustrated in metaphor (an utterly common trope in quotidian communication) and quantum mechanics. To seek tilde-style reconciliation is, in my view, the action of a lurching inner zombie.

Although movement is constantly implicated in Kelso and Engstrøm's work, they rarely give it adequate acknowledgement. Here is one important place where they do.

It is the coordination of movement of human beings and the brains that give rise to them that have driven and continue to drive the development of a science of coordination, and now of complementary pairs. It is true that when one climbs on a

¹⁹⁴ See Thelen and Smith, p. 51. Also see discussion of free will in Ch 8 below.

¹⁹⁵ K&E 178

rock and one's feet slip, the force of gravity overcomes the force of holding on. But there is more to climbing than gravity. It seems that for living things that reside at the scale of everyday human existence, we must complement the information-free mechanics of motion with the informationally meaningful dynamics of coordination.¹⁹⁶

It is clear in this passage that Kelso and Engstrøm understand that the brain gives rise to movement, whereas in this book I have proposed a primacy to movement or better the essential copresence that is movement. Nonetheless this passage is important in recognizing that the brain, which is the principal concern of their work on coordination dynamics, is not an isolated organ or one that is the most central and singularly important. They acknowledge that the coordination of human movement is a principal motivator for brain coordination dynamics. Edelman acknowledged that beyond his three tenants there needed to be something like a value system that motivated the functioning of the others yet he attempted to locate it in brain chemistry. As Kelso and Engstrøm recognize movement of the whole organism they then, seemingly necessarily, also recognize the organism in connection with its environment (the rock one climbs). I argue that self-movement is not possible without "other" or environment; Thelen and Smith's work strongly supports and documents this position.¹⁹⁷ And this aspect of movement gives rise to what was also acknowledged by Edelman, the relationship of organism to environment.¹⁹⁸ One factor that necessitates the nonlinearity in coordination dynamics is the unpredictability of the organism moving in an environment (one's feet sometimes slip). Experience—self-moving in an environment (to be obviously redundant)—is an open system with unpredictable variables that must be coordinated, but cannot be determined or predictable because of the nonlinearity they introduce.

Synaptic Plasticity and Self-Assembly

Neuroscientist Joseph LeDoux does not explicitly identify his work as coordination dynamics, yet in his 2002 book *Synaptic Self: How Our Brains Become Who We Are* he locates the self in the complex variability and coordination processes that are associated with the synapse. Put simply as he does in his opening sentences "The bottom-line point of this book is 'You are your synapses.'"¹⁹⁹ It is clear in his focus on self, implying unity and coherence, that he is centering his consideration of coordination on synapse. This is important in the context of this discussion in terms of the awareness that a synaptic connection is nothing like the closing of a simple switch to make a connection; nothing like a spark that ignites an explosion in an internal combustion engine. Synapses have remarkably complex criteria and a character much more like fluid dynamics with electrical implications that, like proprioceptors, are both excitatory and inhibitory. Synapses have cumulative properties, like acquired skills or accumulated experience, in that repeated coordinated, that is time-locked or in synchrony, synapses establish changes in the synaptic criteria that perpetuate coordinated synapses. Synapses even in different terminus of a

¹⁹⁶ K&E. 78.

¹⁹⁷ Thelen and Smith On importance of environment ...

¹⁹⁸ Edelman ... where ?

¹⁹⁹ LeDoux ix

single neuron may function differently and also synapses that occur widely separate from one another in the brain are capable of coordination. As coordination dynamics is recognized as being inseparable from the appreciation of life, it is no stretch to consider that self and synapse are, in some senses, inseparable. Of course, my standard objection is the overly reductive exclusivity of focusing on the brain and nervous system and even one aspect of that in this case. LeDoux states it strongly in holding that the intent of his book is to show how “the brain makes the self.”²⁰⁰ LeDoux discusses no role for self-movement.

Despite the confines of his brain-in-the-skull focus, LeDoux sets forth a variety of principles for what he calls “self-assembly” that is “how synaptic plasticity occurring in multiple neural systems is coordinated in the process of assembling, and maintaining, the self.”²⁰¹

LeDoux begins with the obvious observation that while there are many parallel and separate areas of the brain that process stimuli differently, because of the unity of the environment they are all engaging aspects of “the same world.”²⁰² Importantly here is the awareness of the manifold complexity and multiplicity of parallel processing in the nervous system. Despite so many parallel channels, because these are all ultimately initiated by external stimuli they are all processing the same world in different ways. Yet, as in perception, the world gets segmented into channels of stimuli processed in parallel—sight, sound, smell, taste, and endless others—the coherence of both the world and the self are nonetheless almost always retained. I’ll consider the relationship between coherence and smooth movement later. We do not see one world and hear another; we have the sense that these are aspects of the same world.

As the brain divides the world there must then be an accounting of how it retains both a sense of self and world and that both are coherent, whole. This is one of the problems asked by coordination dynamics and LeDoux approaches it in terms of the “binding problem.” LeDoux appeals to synchrony as the clue to this binding that was first developed in 1949 by Donald Hebb in *The Organization of Behavior*.²⁰³ This principle of synchrony is widely stated in the popular phrase “synapses that fire together wire together.” And while the mechanism for synchrony is not apparent, what is clear is that repetition conditions the criteria of synapses that assemble patterned connections among neurons; repeated synchronous acts result in binding neurons in related ensemblings or groups or, in LeDoux’s terms “assemblies.” Coordination dynamics has provided some of the answers about how such binding works.

Addressing some aspects of my naïve question that I can’t seem to dismiss—the variation that resists synchronization due to different neurotransmission speeds and distances of action potentials—LeDoux points to modulators as playing a key role in coordination. Modulators are neurotransmitters that influence the recovery time from a synapse occurs thus shaping its timing. By influencing the rate at which a neuron can synapse (or a particular axon can synapse), modulators provide a means of coordinating synapses to accomplish the synchrony that is understood as binding. Modulators then can assist in

²⁰⁰ LeDoux, 12.

²⁰¹ LeDoux, 307.

²⁰² LeDoux, 308-10.

²⁰³ Discussed by LeDoux, 134-5, 310-12.

assembling groups of neurons that act together as memories, concepts, images, and so forth. In the final chapter, “Fat Present,” I’ll return to the issue of the necessity that this “time-lock” is messier or perhaps more resounding in its presence than what might be assumed as an electrical synchrony.

As animate organisms become more developed through evolution, those with more developed brains have, according to LeDoux, “convergence zones” like the hippocampus (and there are other zones). In these convergence zones “small sets of synaptically connected cells, called ensembles, receive convergent inputs from lower levels in their processing hierarchy, and represent faces, complex scenes, and other objects of perception.”²⁰⁴ And quite remarkably, doubtless involving reentrance, once convergence occurs in one system within the brain it begins to occur across systems; ensembles coordinate with other ensembles (the process that Edelman described as degeneracy).

LeDoux also accounts for not only the processes that occur between the environment and the brain, but he also indicates that what occurs in the brain in turn shapes intention and motivation; he calls this “downward mobility.”²⁰⁵ It is here that LeDoux opens to the possibility of nonlinearity in the system; he calls it either the brain or the self. As the afferent and efferent action potentials occur simultaneously there is influence, or cross-influence, throughout that introduces an element of non-predictability or nonlinearity. Juhan describes this in terms of the internuncial net.

Based on his 1998 book, *The Emotional Brain*, LeDoux includes the impact of emotion as well although he focuses primarily on the unifying and controlling impact of emotion on brain functions. It is the amygdala and the influence on modulators that are the concern to him rather than the “feeling” accompanying proprioception related to movement. Surely emotion and proprioception are linked and essentially so; the importance being the inclusion of the connection with the musculoskeletal system and thus with movement.

By presenting the brain, the synapse in particular, as constitutive of self, importantly LeDoux describes in neuroscientific terms some of the mechanisms of coordination dynamics. He offers a variety of principles at work related to various aspects of the coordination that allows the animate organism to function as a whole and to engage the world as a whole world. Coordination dynamics are connected with coherence. To me, as also to LeDoux, the ensemblings aspects of these principles are important and essential. Most of LeDoux’s discussion is in the style of linear functions. He wants to show precisely what happens with given inputs and specific brain functions. The powerful implications of nonlinearity discussed by Kelso and Engström, as well as Thelen and Smith, are present in LeDoux’s discussion of coordination dynamics, at least so far as I can determine, only in his discussion of “downward mobility” where efferent functions engage afferent information. Even here LeDoux doesn’t deal with the importance of the unpredictability of the system that occurs in this interchange or the scale of these reentrant operations in the nervous system. The account I am developing here is based on including nonlinearity—novelty, freedom, choice, chaos—as essentially vitalizing.

²⁰⁴ LeDoux, 317. It is interesting that here LeDoux uses the term ensembles, close to the term I have chosen, rather than his usual assemblies.

²⁰⁵ LeDoux, 319-20.

Nor does LeDoux consider the notion of metastability that is, for me, a keystone of Kelso's and Engstrøm's findings. Metastability is the condition where mutually exclusive values are copresent, a sort of oscillating vibrancy. Perhaps put in terms of LeDoux's focus on synapse, metastability occurs in the synaptic gap, an almost virtual space or distance that is both separation and connection. It is this gap, in the philosophical terms of Barbaras, that movement conjoins desire with distance; desire never fulfilled, distance never spanned. Alternately, if self is living self then the copresent implication of the synaptic gap is that it is the source of vitality, the positive negativity of movement as never being in any place but always in process.

Proprioceptive Coordination Dynamics

While the brain in the skull sets the physical perimeter for most discussions of the nervous system and coordination dynamics, it is obvious to all that the nervous system is not confined to the skull. A large part of movement and the coordination dynamics of movement are located in the musculoskeletal system connected with the nervous system in the spinal cord, the reflex arc, with the brain being informed only later. This aspect of neurobiology is related to the slowness of neurotransmission speeds I discussed earlier. There simply is not time for neurotransmission/action potential to travel from sensation to the brain and back to the muscle to avoid injury and to maintain smooth continuous movement. The reflex arc is sensation to cord to muscle; a much shorter distance and a much shorter response.

It doesn't take a specialist to realize that a large number of muscles, some contracting others relaxing, must be coordinated to accomplish the simplest movement. Such coordination is not possible by neurons/synapses alone. The nervous system must interface with the sensory system associated with movement; proprioception. Proprioceptors are ubiquitous in muscles, joints, and tendons. They are sensory endings of the networked nervous systems. Proprioception, as sensation, is also reshaped and influenced by experience and repetition. Proprioceptors are in fact a major entry point of experience into the nervous system; movement is perception. Proprioceptors are essential to coordinated movement; the demands of movement may be the most ubiquitous value that permeates coordination dynamics. Because proprioception is influenced by experience it seems clear that proprioception is intimately linked into the reentrant self-adjusting network that comprises the bulk of the nervous system. Indeed, because proprioception is a copresence of the nervous and musculoskeletal systems it is through proprioception that coordination dynamics expands beyond the strict perimeter of the nervous system to the whole organism. If we think of the reentrant processes that occur in the brain and more broadly the nervous system, involving as much as 90% of all neurons, this reentrance is expanded to the whole body as the nervous system interfaces with the musculoskeletal system by proprioception and with the sensory systems by the various sense organs and of course the many other systems of the organism all operating in parallel simultaneously and intermingling as a network.

Coordination dynamics must be globally involved throughout the organism and the organism's movement in its environment. It is expected that the same characteristics of metastability and nonlinearity pertain throughout.

Ensemblings

In my view, among the most important things to contemplate is how coherence is achieved both within the animate organism, so unbelievably complex and diverse, and also the operation and experience of the organism in its environment. I devote a chapter to a sketch an account of coherence below. Clearly we have ideas, images, memories, and concepts of many types and styles and degrees of concreteness: house, horse, red, coenaesthesia, and so on. I will follow Maxine Sheets-Johnstone, George Lakoff, Mark Johnson, and others in arguing that many, if not all, of these concepts originate in, are shaped by, and contribute to self-movement and touch. In “having” these things (I know the terms are vague), we somehow know that they are readily available to us if needed or triggered. Almost all of them are understood as bounded in some way enough to be distinct from one another (and they can often be attached to a label however imprecisely), yet we also know that these are not comprised nor have they been acquired by precise means with well-defined and indisputable boundaries.²⁰⁶ “A horse is a horse, a horse, of course” yet “horse,” as present to us for our use in living in a world of horses, remains something (vague again!) not precisely defined or delimited. A horse—as the label for category, pattern, concept, memory, experience—is an accumulation and amalgamation of experiences, teachings, information, memories, language markers, and much more. “Horse” has some sense of being not dependent on perception or knowledge in that we are pretty sure “horses” actually exist independent of their being perceived and known. And since individual experiences differ, the ensemblings of ideas and memories and concepts we refer to collectively as “horse” differ from individual to individual. I have an older cousin that spent his entire life devoted to horses as a veterinarian for race horses and breeder, sulky driver, and constant companion; just imagine the extent and complexity of the ensemblings triggered for him by the simple word “horse.” While these ensemblings are local and individual, they are also in some sense global and general and generic and categorical in that they reference a common category of actual objects in the world. The local and global are always necessarily copresent. While this ensemble is distinct and integral (horses typically aren’t also houses or dogs), its borders are fuzzy and amorphous and constantly changing and subject to change. These fuzzy groupings and ensemblings are, in the most superficial outline, neuronal groups (Edelman) or nerve cell assemblies (Freeman and LeDoux) achieved by the coordination dynamics that, through the repetitive associations of synchronous (time-lock or “fire together”) experience establish synaptic criteria. Such ensemblings must necessarily be a product of coordination dynamics. Coordination dynamics are inseparable from such ensemblings; that’s the point of coordination.

I use the awkward form “-ings” for ensemblings to hopefully remind (via frequent awkward bludgeoning) of the ceaseless dynamics of ongoing coordination. “Horse” is never just one clearly bounded ensembling (group or assembly) tidily residing in a clumped network of neurons located somewhere in one’s brain. “Horse” is always an ongoing, thus dynamic, coordination, of enormous complexity that is changing itself even (nonlinearity) as it is precipitating coherence in application/movement. It is also fuzzily interwoven (degeneracy) with countless other ensemblings such as animal, saddle, cowboy, horsemanship,

²⁰⁶ The discussion of qualia and atomistic approaches seek some fundamental building blocks of experience [discuss this further] and Tse discusses these ideas.

Trigger, paint, appaloosa, pony, colt, foal, quadruped, rodeo, circus, Indians, and on and on. And, as I understand coordination dynamics, they function to dissipate such ensemblings (choosing among possibles) as importantly as they precipitate them. It's all process.

It is fascinating that we all live with this certainty of knowing what (or perhaps better that) we know; yet we all live with the accompanying certainty that we kind of suck (but that turns out to be a good thing) when it comes to articulating or delimiting or isolating what it is that we know. We always know more than we can say or think or remember.²⁰⁷ We have no hesitation locating horses and distinguishing them from other animates and most of us can do this by the age of two, but we are nearly helpless when it comes to articulating the basis on which we hold this certain knowledge. Oddly, the more formal definitions are the least satisfying. Most importantly, the inability to delimit with precision is not a lack, as it is so often framed when we demand of someone a clear and unambiguous definition; rather it is at the source of the richness of the experience that goes into, accumulates as, our knowledge and understanding of "horseness."²⁰⁸ And everything else. If our knowledge and concepts of "horse" were fully and precisely defined, it seems to me our interaction with actual horses would be remarkably predictable and limited. We would truncate our capacity to experience and to learn and to interact in any experience-related ways. And the fleshy horses out there beyond us would also suffer in having to exist only in terms of the rigid ways our clearly defined ensemblings would allow. Surely the very joy and richness of moving/touching life is in the unpredictable elasticity (that is, the nonlinearity) of who we are, what we know, and the world we encounter. For example, while we know that horse is not house, it isn't difficult to imagine horse as house. Vitality oscillates in the copresence of the novelty of the "now" and the predictability and knowledge essential to constructing it.

Beyond that, to articulate "horse" in words is to use but one necessarily linear mechanism, a succession of words or sounds, to replicate (or transmit) what occurs in remarkably complex reentrant parallel yet degenerate aspects in our neurobiology. What is perhaps the greatest achievement of coordination dynamics is that we have a feeling kind of knowing that a word/sound "horse" corresponds with a vast complexity of elements that

²⁰⁷ Michael Polanyi made this point long ago.

²⁰⁸ As a religion scholar for a few decades, the constant issue of constructing definitions of religion has always seemed somehow misguided. We seem so utterly frustrated that we cannot define religion in any precise way or in a way that is broadly accepted. However, if we approach religion as something that is understandable in terms of a skillset developed through the experiences of encountering and studying religion, then we should appreciate why we can't accomplish this seemingly essential academic act of definition. The more experience we have as scholars encountering the constantly expanding array of objects, behaviors, histories, principles, ideas, images and on and on that are connected somehow with the word "religion" the greater the complexity of the cumulative experience we have attached to this term. While our skills at understanding religions and how to engage what is distinctive and important about them become constantly refined through the experience of studying them, surely it is clear that the possibility of hard defining edges to the category become increasingly diminished and even undesirable. A general principle might be that things easily defined are not worthy of much of our interest.

may be ensembled in near infinite ways as needed. This function of language comprises something of copresence as well. “Horse,” the word, is and is not “horse” the ensemblings; is and is not the “horse” that exists as object and category of objects independently of us. The power of the word is traditionally located in the precision of representation, definition, boundary, that is, reference; yet the power of the ensemblings that are copresent with word is in the fluidity and mutability of boundaries, in the open potentiality of coordination with almost anything else in the unknowable range of application, in the endless transformation and development. The word and the paired ensemblings could scarcely be more different, yet we unapologetically identify them. Certainly, if it hasn’t yet become too tiring, vitality, life, is precisely the implication of this copresence.

While our entire academic hierarchy is constructed to achieve knowledge with some certainty and completeness (a retrograde movement or a backfilling), a certainty we cannot accomplish even if we are scientists, yet the actual strength and richness of our skillful living experience is in embracing the power of potential ensemblings that correlate with fuzziness and amorphous and elastic qualities of our knowledge and experience. I really don’t understand how the academy has managed for so long to hold to strict criteria such as *truth* and *objectivity* when they literally don’t “make sense.” It has been soundly shown that “objectivism,” “classic category theory,” “definition,” and similar notions are simply not how we live, not what occurs in our experience, and they are not all that interesting or important anyway.²⁰⁹

I can feel the nervousness of those readers who demand definition and clarity and certainty and surely most of us frequently have these needs. My conclusion is not to give up precision and exactness and detail of knowledge and the highest skills of movement and thought. Yet, what I believe is the result of the accumulation of and acquisition of these skills and experiences is the ease and pleasure of engaging novelty and creativity that accompanies the absence of certainty and final truths. Ensemblings can enrich accounts even if they confound most efforts at precise definition.

As difficult as it is to do justice to the vast findings of the fields comprising neurobiology, I have simply not been able to avoid attempting to outline some of important features such as architectures of key constituents and the magic actions of coordination dynamics. Beginning with self-movement and the philosophical insights regarding moving, the notion of copresent implication has been found to be pervasive in and fundamental to neurobiology; how could it not be?

Experiential Neuronal Ensemblings

What I have sought to accomplish in this chapter is in some sense to overview some aspects of the actual biological processes that are engaged in the living, self-moving, perceiving, knowing animate organism (especially human, but in continuity with all our animate kin). This task proceeds from the implications of self-movement as articulated in the looping (feed forward/feedback) afferent/efferent self-adjusting neurobiological organism in the context of other or environment. I use the term *experiential neuronal ensemblings* in the

²⁰⁹ See Lakoff ??? for some basic critique of objectivism, for example.

effort to implicate all aspects of the moving organism without hierarchy among them: these aspects or systems are copresent and essentially so.

Based on the primacy of movement (self-moving/touching) biology is a remarkably complex self-adjusting self-coordinating system that is distinctive in the essential roles of nonlinearity (a factor of both the internal system's processing and also its self-moving in an environment, in context) and metastability by which it holds at once multiple positions/conditions that are in opposition. Experience in connection with the external, the sense of feeling movement, the sense of moving/touching encounter with the environment, and the cumulative effects as neuronal groups (ensembles) are ever present. The skillful processes of life include the accumulation of patterns or ensembles that emerge and dissipate as needed. The ensembles are interdependent with gesture and posture. They are the essential basis for perception that must be seen as an active process, as movement. Memory and knowledge are materials for creating as well as products of ensembles. It is the constantly active ensembles that are copresent with/as self-movement that comprise the skilled processes of living. Copresence is characteristic of the architectures of the components as well as of the most constitutive functions as reflected in the organism's coordination dynamics. As it has evolved in human animals copresence is the fundamental organization dynamic and is synonymous with self-movement. It doesn't seem possible to be anything other than delighted, amazed really, and awed by these ensembles of the artful complexity of our deepest and most pervasive vital twinings.

7 Perceiving and Knowing

Michel Serres said it more poetically, “”

Comment [SG29]: Find this and make an epigram

Most studies of perception focus on the five senses. Occasionally kinesthesia is considered as an additional sense. Most western contemporary sensoria place vision and hearing as the most important senses, with smell and taste below them. Many studies of perception are based on extensive, if not exclusive, use of vision examples.²¹⁰ Touch, not having its own exclusive organ of sensation or bundle of dedicated nerves terminating in specific brain regions, is often placed at the bottom. Touch, taste, and smell are often considered the lower or animal senses. Kinesthesia is typically limited to the sense of body awareness, particularly when the dominant sense of sight is unavailable. Self-movement is not commonly explicitly considered in any significant way as relevant to perception.

In the midst of my studies of dancing and the relevance of some of the implications of neuroscience for the study of religion and culture, the writings on self-movement of Maxine Sheets-Johnstone and Renaud Barbaras (who interestingly do not cite one another) and others, prompted me to understand that a study of perception based on movement, especially self-movement including the role of proprioception, would be a fascinating and important endeavor. My initial plan for this book was that it be a sense by sense study of perception distinguished by showing how each sense is dependent on self-moving. What I had come to understand that I wanted to argue is that perception is inseparable from self-movement. I wanted to understand self-movement as the most fundamental sense and, having established that, to look at each of the common five senses in terms of movement.

Early in this process I began to understand that self-moving involves proprioception, not discussed by Barbaras or Sheets-Johnstone in any explicit way or to any extent. Understanding proprioception became increasingly important to my understanding of movement, especially guided and inspired by Brian Massumi's work. One important realization in this inquiry has been the appreciation of the intimate interconnection of moving and touching, a connection Merleau-Ponty made long ago. His notions of chiasm, reversibility, and flesh (approximate synonyms) gained clarity and depth for me when approached from the perspectives I have been developing here, particularly proprioception; biological perspectives that he implied, but didn't discuss explicitly. I have adopted his more generic “copresent implication,”²¹¹ another approximate synonym to his more favored terms, as a core idea, one that I have been exploring throughout every chapter of this book.

As I suppose always happens, one thing leads, seemingly necessarily, to another and I began to understand that I was actually most interested in how the self-moving/touching processes that are essential to understanding perception, are fundamental to understanding the living processes (vitality) of the animate organism. It is fascinating that many writers who seriously engage the issues of perception and moving come to understand them as fundamental to life and vitality. Merleau-Ponty's focus on specific

²¹⁰ This is true for Alva Noe's work that I will consider more fully later in this chapter.

²¹¹ Merleau-Ponty ... where does he refer to copresent implication ... think it is in discussion of pure depth ... need to find.

examples of touching, as I will present, revealed to him something more than a theory of perception; more significantly, an understanding of what he unapologetically called “ultimate reality.” Barbaras’s use of the term “living movement” is in a sense redundant yet it attends to the identity of vitality with self-movement. Sheets-Johnstone’s arguments for the primacy of movement, understood radically as I am attempting to do in this book, places self-movement as ontogenetic. Some may feel that understanding self-movement is overly reductive, yet it does seem that it should be mandatory to see self-movement as synonymous with life especially if we take at all seriously the implications of Husserl’s term “animate organism.” What I have found and am attempting to do in this book is to use the philosophical and physical criteria of movement as the foundational criteria and model for vitality and each of the dynamic systems that comprise the animate organism.

Barbaras’s philosophy of movement, that actively engages Potchka’s writings, complemented by Brian Massumi’s philosophical discussion, both in part developing the positions of Henri Bergson, provide the insight that it is the moving aspect of movement, the ongoingness of moving, the “-ing” of movement, that has the most provocation and potential. It is this “-ing” aspect of movement that has become the core of this book as it was in a different way in my recent book on dancing. Of course, Maxine Sheets-Johnstone’s massive work on movement has also been essential. I’ve attempted to capture key aspects of that “-ingness” as “copresence,” the entwining and identity of two or more things that depend on their mutual exclusivity for their distinctiveness. I remind that it is copresence that I believe is the key to comprehending the distinctiveness of vital force that enables ontogenesis. It is this impossible possible that allows us to gain the clues to who and what we are and how we relate to our animate kin as well as to our environing world.

What has been essential for me to develop is that, while at first copresence seems at best an unusual and surely marginal condition or structurality, when we become open to how it occurs structurally and functionally and recognize that movement and vitality are possible only as copresence, it begins to appear everywhere, even as the most quotidian.

Copresence is metastability in coordination dynamics that function deep in vast reentrant neuroprocessings as well as in social relationships among groups of people. Copresence is at the core of neuron/synapse processing as well as fundamental to metaphor, a core trope of all natural language. Copresence is basic to proprioception—the neuromuscular union—that allows experience to be felt as well as accumulated into neuronal groupings essential to perception, memory, knowledge.

Having explored copresence from a number of perspectives and a variety of terms, it is finally time to come to the consideration of my original inspiration and focus on the senses. But, of course, as this inquiry has unfolded, the relationship of perception to movement is inseparable from the relationship among perception and movement and knowing. The concern now has become perceiving rather than the individual senses more appropriately considered in terms of body.

Comment [SG30]: Correct spelling ... and identify who he is.

Perceiving

Flesh, Chiasm, Movement/Touch

The French phenomenologist, Maurice Merleau-Ponty, is arguably the most important scholar in reshaping the current philosophical understanding of perception. Interestingly, the folk understanding of perception, supported extensively by the common language related to perception, continues to support the more objectivist and representationalist view of perception, analogous to the *camera obscura* (Latin; *camera* for "vaulted chamber/room", *obscura* for "dark", together "darkened chamber/room"). This deeply entrenched and naturalized view (this common use of the word "view" betrays the naturalness) is that our senses are more or less dependent on objective instruments, our sense organs, that simply measure the world around us like cameras or scientific recording instruments and project into (or even onto like a screen) the brain the sensation of the environing world as images and representations that correspond more or less one-to-one with the world beyond us. While this view persists even in many academic understandings of perception, since mid-twentieth century there have been extensive and convincing arguments supported by considerable evidence to show that this representationalist understanding is not accurate and it greatly misunderstands the remarkable processes involved in perception; it is simply not how perception works.²¹² The developing understanding of perception amounts to a revolution in the way we understand ourselves as human beings.

Maurice Merleau-Ponty was dissatisfied with this objectivist/instrumentalist/representationalist view and his philosophy offered a critique and an alternative. It is easy to quickly get mired down in difficult images and language and become rather frustrated by the style and opaqueness of his presentation of this perspective. While it may seem to be just compounding the matter, I think that against the background of the architecture of the neuron and proprioception and a discussion of experiential neuronal ensemblings, Merleau-Ponty is actually more easily understood.

Merleau-Ponty began with what for him was a quintessential example that he returned to time and again, one hand touching the other hand.²¹³ Here is how he put it:

[quotation]

I picture this more like the finger of one hand touching the finger or hand of the other; movement seems implied yet not explicitly included. The very ambiguity here is fascinating reflecting the remarkable complexity and diversity of implications even in the architecture of the hand. Merleau-Ponty was fascinated by this touching/being touched example, because he found that touching and being touched, as action and recipient of action, are clearly different and cannot be simply combined (we can think of axon and dendrite as parallel). Yet as he observed, this pairing can be flipped or reversed (the term "reversibility" is one he used extensively), the touching and the touched shifting positions

Comment [SG31]: Find the right one.

²¹² Most recently perhaps is Alva Noë's *Varieties of Presence* (2012) which I will consider in much detail at some point.

²¹³ Husserl used this hand-to-hand example before him and there are many other examples. I will collect and reflect on them one of these days in the context of feet.

or roles by simply shifting agency (intention).²¹⁴ While Merleau-Ponty found that touching and being touched are necessarily separate, distinguishable, touching and being touched are also inseparable or reversible because they are of one body. The left hand doing the touching is of the same body as the right hand being touched. Here is how Merleau-Ponty described other aspects of this relationship.

If my hand, while it is felt from within, is also accessible from without, itself tangible, for my other hand, for example, if it takes its place among things it touches, is in a sense one of them, opens finally upon a tangible being of which it is also a part. Through this crisscrossing within it of the touching and the tangible, its own movements incorporate themselves into the universe they interrogate, are recorded on the same map as it; the two systems are applied upon one another, as the two halves of an orange.²¹⁵

Merleau-Ponty's discussion does not include proprioception, the inner touch, yet his phrase "felt from within" can be understood as referring to proprioception. He appears to be distinguishing between the sensation of being touched on the skin, via exteroceptors, and the feeling within of touching, by means of the pressure that occurs with any impression of mass on the body, the body in motion. What is notable, from the perspective that I am developing, is that the connection that he is discussing is between the exteroception of touch, surely felt by both touching and being touched, and the interoception/proprioception of inner touch, surely also felt by both touching and being touched. While contrary to Merleau-Ponty I and others (cite ss-J) suspect that touching and being touched are not necessarily impossible to sense simultaneously—which would mean that the distinction is more of a logical one backfilled by the analysis of the experience of sensation²¹⁶—there still is a dual axis that suggests that there are implications of copresence. Exteroceptive touch and interoceptive touch are distinct (as distinct as are outside and inside) and they engage different biological mechanisms, yet they are copresent. One hand seeming to act on the other hand indicates a vector of intentionality; the direction of that vector can be reversed by a change in intention. Merleau-Ponty is rather vague on how these constituents are understood as experienced as copresent, holding only that they are "of one body." The identity appears to be based in the possessive pronoun "my," as in "my hands," yet Merleau-Ponty doesn't discuss, in this passage anyway,

Comment [SG32]: Do this

²¹⁴ [probably don't need this in this footnote, will take it up later in this section, but it is saved here just in case] He didn't present it this way, but I would suggest that this shift or reversal is always necessarily accompanied by the incipient aspect of movement. That is, the hand doing the touching is always the one that feels the preacceleration (Manning) or the desire (Barbaras) or incipient (Masumi) quality of movement; that is, movement in the sense of beginning to be moving, the urge or the almost that is key to understanding what movement itself is. Whereas the hand being touched is the goal or, as a target or object desired, describes the distance to be closed by the movement of touching.

²¹⁵ M-P ????? citation?

²¹⁶ The point here is that, approached from the perspective of experiential neurobiological ensemblings, all touching (there can be no first touch or un-contextualized touch) is informed in some sense by one's entire history of touching.

how we know our two hands to be both separate in terms of intention and action while being also simultaneously radically copresent, as “me” or “mine.”

I, of course, throughout this book have attempted to demonstrate that it is self-moving that is the basis of this felt identity of the various constituent parts and systems with the one, the whole, that is me; since self-moving, as inseparable from touch particularly inner touch, comprises the quintessential copresence. It is in the feeling, a quality of the self-moving/touching copresence, that we know the parts comprising body as self; these two hands are “my hands” because I feel them to be “me,” objectifiable as “mine.” This feeling is fundamental to the biology of self-movement including coordination dynamics, the mechanism by which the complexity of entwined networks can function while retaining the presence of mutually exclusivities. Merleau-Ponty acknowledges movement as he explores in terms of crisscrossing how touch and touching “movements incorporate themselves into the universe they interrogate,” that is, the body and, by extension, the world.

Merleau-Ponty developed this fundamental example of copresence, which he termed most distinctively “flesh” and “chiasm,” in the broad terms of perception. This copresent implication was, as Merleau-Ponty understood it, not distinctive of touched/touching alone, but of all perception, all perceiver/percipient relationships. In other words, based on the insights of touch/touching, we can understand all perception as having this same relationality. Merleau-Ponty called this larger frame the “flesh of the world.” This globalization of touch/touching to perceiver/perception leads to confusing, perhaps impossible, implications of reversibility. For example, in terms of sight, the reversibility would suggest that the seer and what is being seen are reversible; as I see the tree the tree sees me (to use a poetic form of chiasm to illustrate). Merleau-Ponty nonetheless understood this relationship to be not only fundamental to perception but, as he proclaimed, “the ultimate reality.”²¹⁷

Certainly, Merleau-Ponty’s understanding of perception established a major shift from the *camera obscura* or representationalist perspectives. He stated this distinction cogently.

If the body is one sole body in its two phases, it incorporates into itself the whole of the sensible and with the same movement incorporates itself into a “Sensible in itself.” We have to reject the age-old assumptions that put the body in the world and the seer in the body, or, conversely, the world and the body in the seer as in a box. Where are we to put the limit between the body and the world, since the world is flesh?²¹⁸

This is a remarkable passage outlining copresence in terms of global and local, body and other, perceiver and perceived and it establishes movement as fundamental while rejecting the representationalist and instrumentalist understanding of perception.

Merleau-Ponty did not mention any biological support for his phenomenological reflections, but it is possible to do so as hopefully I have introduced in the previous chapters. If we place

Comment [SG33]: Find the quote

²¹⁷ Merleau-Ponty ??

²¹⁸ Merleau-Ponty, ???

-Ponty's chiasm in the terms of coordination dynamics, we can see that he is describing in philosophical terms something similar to metastability as articulated mathematically and biologically. Of course my presentation of metastability is a necessary **transduction**. Metastability is the process in which opposing positions can be simultaneously held as the vitalizing process of massively complex self-coordinating systems. The neurobiology and mathematics of coordination dynamics further ground Merleau-Ponty's understanding of perception as involving both the world that is perceived as well as the perceiving being. These are inseparable and copresent and perception is the ongoing process implicated by this copresence. Perception is an entwining of self and world, of thing perceived and the perceiving subject.

[discussion of sea/strand in "Chiasm here?? From AA pp. 90. I pasted in those paragraphs and indented them.]

Maurice Merleau-Ponty was among the first to shift radically, although it is certainly clear he built on the work of many others. As a lifelong student of perception late in his life Merleau-Ponty came to a new stage in his understanding. I really love a passage in his writing that is near the beginning of his acclaimed rather complex essay "The Intertwining—the Chiasm."

The visible about us seems to rest in itself. It is as though our vision were formed in the heart of the visible, or as though there were between it and us an intimacy as close as between the sea and the strand. And yet it is not possible that we blend into it, nor that it passes into us, for then the vision would vanish at the moment of formation, by disappearance of the seer or of the visible. What there is then are not things first identical with themselves, which would then offer themselves to the seer, nor is there a seer who is first empty and who, afterward, would open himself to them—but something to which we could not be closer than by palpating it with our look, things we could not dream of seeing "all naked" because the gaze itself envelops them, clothes them with its own flesh. Whence does it happen that in so doing it leaves them in their place, that the vision we acquire of them seems to us to come from them, and that to be seen is for them but a degradation of their eminent being? What is this talisman of color, this singular virtue of the visible that makes it, held at the end of the gaze, nonetheless much more than a correlative of my vision, such that it imposes my vision upon me as a continuation of its own sovereign existence? How does it happen that my look, enveloping them, does not hide them, and, finally, that, veiling them, it unveils them?²¹⁹

I regret that we don't often take time to settle in for a long careful discussion of such passages. Seems we must rush along; our responsibility is our irresponsibility; our efficiency is our inefficiency; our breadth our shallowness. Enantiodromia.

Comment [SG34]: Use word correctly or get different one

Comment [S35]: ???

²¹⁹ Maurice Merleau-Ponty, *The Visible and the Invisible* (Evanston: Northwestern University Press, 1968), p. 131.

Still this passage requires attention. Merleau-Ponty feels that our vision is formed in the heart of the visible. The visible is that which is subject to being seen. In the heart of that world is vision formed and certainly necessary to it. Now Merleau-Ponty seems to identify “us,” that is human beings, with our vision when he writes that there is “an intimacy between it [that is, visibility] and us as close as between the sea and the strand.” Strand is that strip of land along the edge of the sea and we understand how intimate this relationship is. Using the word “strand” which can also mean “to leave someone in a difficult or helpless position,” Merleau-Ponty anticipates his discussion of chiasm, folding one meaning of the word onto another, of almost opposing value, as he continues by saying that it is not possible that vision, that is, humans, blend into visibility or visibility into vision. We must remain stranded, estranged, otherwise, as he writes “vision would vanish at the moment of formation, by disappearance of the seer or of the visible.” Our eye must be at a distance from the seen. Vision and visibility, our senses, our being human, and our environment, are born of one another, enjoy an intimacy, are interdependent, yet are separate, cannot be blended or reduced to unity.

Merleau-Ponty goes on to tell us in this passage about vision/perception/humanity, as he understands them. Things in our environment do not occur all separate and identical in themselves, that is, having an identity and a being with clearly defined distinctions in isolation from being seen. Nor are we seers at first empty visual fields waiting to be filled with these discrete external visuals.²²⁰ What there is is something, as Merleau-Ponty says, “to which we could not be closer than by palpating it with our look.” Here he conjoins touch (proprioceptive touch at that) with vision in this wonderful phrase “investigate by touching it with our look.” That is, we are connected even visually with our world as by touching it. And in touching it, as Merleau-Ponty shows, we do not see it, we do not dream of seeing it, “all naked” (naked indicating some pure objectivity). Rather our touching look “envelops ... clothes [the things of the world] with its own flesh.” Our gaze, as Merleau-Ponty imagines it, has “its own flesh.” To see something is to touch it in such a way as to make it our own, to make it of our own flesh. Yet, as Merleau-Ponty reveals in a series of questions, both actual and rhetorical, such a touching gaze does not hide the things in the world, does not destroy their own sovereign existence, but rather, in veiling them, clothing them, actually unveils, reveals them.

The discussion of experiential neuronal ensemblings provides biological background to extend our understanding of Merleau-Ponty’s philosophy of perception and to conjoin it with a complex view of experience. Perception is not limited to the moment, as the instant snap of a picture, but is a process ever growing in depth, complexity, and skill through the cumulative experience of practicing perception as inevitable to ongoing living perception. The neuronal ensemblings contribute actively to the ongoing perception, yet the sensation stimulated by, originating in, the environment are copresent with them. Here, as Merleau-

²²⁰ Ganzfeld

Ponty was at pains to show, the relationship is one of chiasm, a crisscrossing in which both are constantly present to the other despite being different. And, the very sense of the success of perception, that is, that we somehow perceive the world and ourselves, is evidence of the coordination dynamics operating on all of this disparate complex data system.

Perceiving is Moving, Moving is Perceiving

[see and integrate Thelen and Smith's section "Movement as Perception" 193f]

Comment [SG36]:

In his book *Desire and Distance: Introduction to a Phenomenology of Perception* (1999, 2006) Renaud Barbaras writes "One has no choice but to concede that bodies that perceive are *living* bodies and that they are distinguished from other corporeal beings . . . by their capacity for *movement*."²²¹ Perception then should not focus primarily on aspects of a body such as sense organs, but rather on the capacity for movement that distinguishes the life of bodies that perceive. Movement, specifically self-movement, is inextricably entwined with perception. Barbaras writes, "Perception puts the living being in touch with what is spatially at a distance and desire puts the living being in touch with what is temporally far away."²²² Put a bit differently, while all animate organisms perceive, their bodies are equipped in a wide variety of ways to accomplish perception. I'll consider the implications of the capacities to sense color of the Mantis shrimp. To focus on the wide array of say color vision among animate organisms is fascinating and much can be learned, yet Barbaras is indicating something more fundamental about perception; it is entwined with self-moving or the animateness of organisms that move themselves. Living movement has a greater primacy than noses and ears and tongues.

The radical position of Barbaras, as I believe we must consider it, can be put in a poetic chiasm (inspired by Merleau-Ponty): perceiving is moving, moving is perceiving. How to comprehend this chiasm? I want to begin by considering aspects of the time-consumption of action potential in the setting of coordination dynamics. In other words, while this seems a bit technical (but that is why I've developed the background to make this possible), I want to consider the reaction time from physical stimulation (sensation) through ensemblings that form intention to motivate a movement response. This time-consuming process aligns with my fascination with the slowness, yet perhaps only when compared to electricity, of this process. Remember that electricity is something like three million times faster than neurotransmission and action potential speeds. I sometimes demonstrate the slowness of this process by the common game we play to demonstrate reaction times. Have someone hold her hand still with her forefinger and thumb an inch apart. Place a \$100 bill (the high amount for more fun) between the thumb and forefinger about a quarter of the way up. Tell the person they can have the money if they can catch the bill by clasping it between their finger and thumb when they see it released. Of course, this can't be done, unless one anticipates, because of the reaction time. Yet, a robot could easily catch the money; in fact to the human eye observing the robot the money wouldn't noticeably move at all.

²²¹ Barbaras, D&D, 86

²²² Barbaras, "Life, Movement, and Desire" 9

What is so valuable about this little example? Barbaras says that if reaction time were instant we would perceive nothing; “the immediacy of reaction goes hand-in-hand with the absence of perception.”²²³ This observation suggests that perception occurs in the negotiative, circulating, looping, processes that interweave stimulus and awareness/response involving what I have described in terms of experiential neuronal ensemblings. To short-circuit this complex time-consuming process correlates with the secession of perception. We have common experience to confirm this, such as reaction time. Autonomous cars will be able to drive much closer to one another because they will not require the distance to accommodate human reaction times. Perception occurs in the negotiative spacetime between raw sensory stimulation and recognition and response. Perception is not simply mechanical or instrumental recording. Perception is inseparable from movement, or as Barbaras terms it, *living movement*. Surely this is the self-movement we “feel” as the very quality of life. It suggests that perception is a name for the way that we “experience” this living movement including the ensemblings of neurobiological processes required to give specificity, recognition, identity to sensation. This example helps us begin to see that the ongoing self-moving of the animate organism is inseparable from the ongoing processes of experiential neuronal ensemblings that enfold perception.

Deepening this point, Barbaras²²⁴ restates the position, “*it can be inferred that perception originates in the reaction’s delay.*”²²⁵ In the terms I have been developing, perception then is an important function of the remarkably complex reentrant process shaped by self-coordination dynamics engaging synaptic processes involving criteria for synapse, neurotransmission, *action potentials*, the reentrant chaos of information flowing through the internuncial network where it invokes experience and memory and skill, taking some form through the ensemblings processes of coordination dynamics leading to recognition and identification of sensation; this process is ceaseless (an ongoing process) and ever self-transforming. Even though this process, if backfilled to a single stimulus and response, consumes perhaps a third of a second the distances traveled seem enormous and the complexity of the hydroelectric processing is nearly incomprehensible. Perception originates, as Barbaras writes, “in the distance that separates the external impulse from the reaction.”²²⁶ Perception arises in the resounding relationship between stimulation from bodily sensory encounter with environment and the experiential neurobiological ensemblings that pervade the body. Barbaras places perception as the encounter in the space where the external stimulating sensations invoke and interact with the patterns, memories, feelings, and much more that comprise our life experiences resulting in, not knowledge only, but also reaction, that is, a responding movement. According to Barbaras, perception is not knowledge it is movement. He writes, “Contrary to what traditional philosophy affirms, perception has in no way a speculative interest; it is not knowledge but *action*.”²²⁷ Talk about revolution! And Barbaras continues, “the perceived is only that

²²³ Barbaras, D&D, p. 99.

²²⁴ who in this respect is developing on Henri Bergson’s work,

²²⁵ Barbaras, D&D, 99.

²²⁶ Barbaras, D&D, ??

²²⁷ Barbaras, D&D, 99

which the living subject reacts to.”²²⁸ The implications are significant, as Barbaras writes, “the object is not born of a disinterested relation to the world; it is on the contrary constituted by vital activity and, more generally, by action that needs to circumscribe stable entities within a flowing totality.”²²⁹ Thus, what we perceive is not the result of some passive recording of the world “out there” (the reproductionist or *camera obscura* or representationalist view) and it does not arise in some objective measurement given by the world “out there.” Rather the object perceived is born of the process of movement motivated and conditioned by experience (itself based in movement and touch, a proprioceptive process). Perception, as I’ll develop more fully below, is a vital living skill of animate organisms.

Let me try another analogy to help us understand why the relative slowness of neurotransmission/action potential speeds is essential to perception. Were we electronically wired our perception might function something more like an Internet search engine. Consider how that might work. Remember that Barbaras holds that no perception occurs without delay. The external stimulus (in our analogy the search request) would produce, in the tiniest fraction of a second (electronic speeds), an enormous number of possible reactions; all available from the history of our own experience (equivalent in this analogy with every possible relationship to the search topic). The choice among these seemingly infinite possible experiential data would need to be based on an algorithm to determine hierarchy (this would require some sort of reentrant self coordination with criteria evolving out of the sensation). The process of selection and inquiry and determining relevance that occurs for us once we get search results would not occur, because the results would simply be stimulus to near instant action near the speed of light, and so on. All of our life would operate at Internet search speeds including our requests, the search, and the reactions. Everything would be near “instant” reaction; the fastest knee-jerk one can imagine. Action and reaction would have no meaningful distinction; they would appear to be mechanically attached. Actually I suspect our muscular system would quickly self-destruct because it simply couldn’t handle the demand of volume of stimuli or the barrage of conflicting instructions for response. We would need to replace muscle and tissue with steel. Now, of course, we might then suggest that we could build into the algorithm time delays via modulators so that we didn’t zip around at electromechanical speeds, but then this would require the attempt to artificially add something like living movement, self-movement, and its incumbent coordination dynamics back into the system to renormalize the system to how it works in our experience. The point that I’m attempting to illustrate here is that the living animate organism is what it is as the result of this essential “delay,” a delay that is experienced and indeed is felt, and accumulated experience, even though this process may seem rather instantaneous to our experience; the delay is the experience of “presence.” Were these times instant we would not be humans (or animate beings) whose life, whose definitive character, is the primacy of movement; we would be lifeless machines that are designed to move.

This issue of time-delay is one of the most interesting aspects of Artificial Intelligence. Machines, I suggest, can’t think or feel because they process too rapidly; a corollary is that

²²⁸ Barbaras, D&D, 101.

²²⁹ Barbaras, D&D, 99-100

they don't have moving bodies that are felt when moving so there isn't a possibility of the freedom of coordination dynamics. For machine intelligence to be anything like human intelligence it would have to be built not on electronics, but rather on some fluid hydraulic mechanism conjoined with electronics with enormous reentrant capabilities that permit metastabilities (holding opposing positions simultaneously, which in electronics is called a "short") and nonlinearity or unpredictability. I suppose the other thing I don't ever quite understand is the connection between robotics and artificial intelligence. Well, I get that it is the connection of intelligence with robots that is why the word artificial is appropriate. However, the more I understand about human intelligence, the less I think it is like or compatible with electronic gadgets. Robotics, as I understand it, is most powerful and important in replicating certain types of human movement especially those that, because of this unpredictable nonlinear aspect so inherent to the human and animate aspect of movement, humans can't reliably and with enough precision repeat endlessly so they are the same every time. To me, this is human movement stripped as thoroughly as possible of the perceptual (in the strictly human understanding of this term, not a metaphorical sense that would apply to inanimates) and the cognitive (which can refer only to the reentrant metastable coordination dynamics) that are its hallmarks. If we comprehend that human perception and intelligence is copresent with human bodies, then to replicate human intelligence artificially would require replicating the whole animate organism. Well, I'm sure many would disagree, enthusiastically. It is interesting to me that robots with artificial intelligence are often crafted to have some semblance of human appearance. The unstated implication here to me is that intelligence, artificially produced, still has a necessary connection with the distinctive human form, although my guess is that the greatest motivation for replicating the human form is the psychological effect of intelligence the form suggests. But then the human form and the parts that form its intelligence are constructed of plastic and metal and driven by electronic or mechanical power; there is no effort whatever to replicate the squishy mucousy bloody fleshy tissuey messy materials out of which all animate organisms are constructed. I am fascinated that the artificial replication of human intelligence invariably attempts to replicate these fleshy matters in plastic and metal when the very hallmark of human intelligence (its plasticity and variability and mobility) is entirely inseparable from tissue, from animate organicity.²³⁰

Barbaras makes another point related to delay when he writes, "A more complex organism perceives to the exact degree to which the reaction does not immediately follow the stimulus."²³¹ This statement suggests that with the evolution of animate organisms the development of the complexity of the experiential neuronal ensemblings correlates with the complexity of the organism as well as with the time required for coordination dynamics to process sensation stimuli into neuron groupings or ensemblings, that is, the response interval between sensation and perception. This of course makes sense. The more complex the potential for self-movement, the greater the capacity for retaining and accumulating experience, the more complicated the systems of motility and ensemblings processing, the longer the reaction time or delay. This does not mean that more complex organisms are "slow" in that sense of dullness, but that they have coordination dynamics

²³⁰ For many discussions of aspects of these fascinating issues see my "Into the Future ..."

²³¹ Barbaras, D&D 99

and ensemblings processes and capacities on a different order than their less complex animate kin. As I will consider in a later chapter, the differentials in reaction time we are considering (though Barbaras doesn't quantify them) are on the order of a small fraction of a second (commonly a third to a half second for humans), yet, in the scope of neurotransmission/action potential speeds and timings the implications are significant; significant enough to distinguish substantial differences among species of animate organisms.

As I will discuss more fully below in the "Fat Present" chapter, this constant processing of stimulus by experiential neuronal ensemblings constitutes something of a fullness of the present. Humans in the constant presence of processes of delay inherent to perception live in a rich or thick or fat present; one characterized, not surprisingly, by metastability and where linear time sequencing is not sovereign. I think this is an extremely important finding.

Barbaras wrote about the transcending aspect of perception in terms of movement, "To move is not to be what one is (or was); it is to be always beyond and therefore within one's self, to exist on the basis of noncoincidence. Within the 'there is' there is negativity only as mobility . . ." ²³² This reference is what Massumi called the "incorporeal" aspect of the body. Remembering the architecture of the neuron helps make sense of this complex statement. Axons reach out to touch while dendrites reach out to be touched. This is their design. This reaching out shows their existence is based on noncoincidence, that is, they are not self-contained or self-sufficient, a type of entity complete in itself, but rather they exist to reach out, to transcend their boundaries. Barbaras describes this design, this "there is," as a negativity, meaning that by its design the human, as also the neuron, exists in terms of a negative as distance in space and desire or need in terms of time. Barbaras sees this negativity as mobility; more than its ability to move, the actual moving. For the neuron this negativity can be understood as the synaptic gap. The synaptic gap is a negativity, a space or gap or emptiness, that marks the necessity for a transcending of self; this transcending being the movement of neurotransmission and accompanying action potential. This break, this negative, this absence of connection (synaptic gap) is at the core of the architecture of neuronal movement, *action potential*. There is a need and a goal associated with the design of the neuron that is the action potential, or the movement, both across the body of the neuron and the reaching across the synaptic gap to *transcend* the neuron.

So too with the design of the animate body, the arms and legs and all sensory organs reaching out to touch and to be touched; transcendence is an essential feature of the design of the living body. Barbaras understands that "Perception is essentially linked to movement. Beings capable of moving are the very ones that are capable of feeling; feeling and moving are the two aspects of the same mode of living, because movement assumes the desire for a goal, which itself requires the capacity for perceiving it." ²³³ This discussion takes us to the relationship between the perceiver and the external world being perceived. In light of the current interest in shifting away from "movement-discouraging" based studies to "movement-encouraging" based studies, it is provocative to consider Barbaras's

²³² Barbaras, D&D 86

²³³ Barbaras, D&D 87.

statement, “instead of approaching life on the basis of the body, as the possibility characteristic of a body, we have to determine the body’s sense of being based on life.”²³⁴ In other words, a body based on life is a self-moving body, not an inanimate material object that has the capacity to move.²³⁵

Sheets-Johnstone grounded her understanding of the primacy of movement, in part, on the observation that we are born into the world moving, that we are not taught or need we learn to move, and that movement is at the core of our discovery and construction of the world and ourselves. From Barbaras’s perspective this movement arises from an inherent negativity, an openness or distance that coincides with a desire to move, that is to reach out to connect or touch. Moving is inseparable from this negative, the distance/desire that marks copresence, that cannot be fulfilled by moving. Any sense of fulfillment is equivalent to stopping the moving. I referred to this infant movement, that Sheets-Johnstone discussed, by the term “groping.”²³⁶ This term is a good one I think because it shows the propensity of movement, insatiability of movement, without the expectation of some movement-stopping satisfaction. Groping is a propensity or continuing desire to move characteristic of Barbaras’s interpretation of the terms “desire” and “distance” which are conjoined in the title of his book. Movement arises because of distance or space or gap or synaptic gap, and the desire to transit the distance, to close the gap, to synapse, yet it is the nature of movement that desire and distance are not accomplishable (to do so would end the moving), but rather only folding back on movement as its fuel. Movement and perception are copresent as expressed in the “there that is here, but at a distance.”

Shifting terminology a little. “To grasp” movement is “to not grasp” movement, because to hold would take the moving out of movement, turn moving into gridded analysis. To grasp is to accomplish a backfill, a territorialization, a retrograde. However, *grasping*, like *groping*, can be seen as consistent with our discussion of living movement, self-movement. Grasping is like synapse. The word synapse, from Greek *syn-* (together) and *haptēin* (to clasp or to touch), understood as process is neuronal grasping. Grasping²³⁷ conjoins movement and touching in perception²³⁸ and as such pertains to all perception.

A remarkable issue arises at this juncture of our discussion. If grasping, reaching out to touch with intention even if unconsciously done, is perceiving, then there appears to be some “grasp” that precedes the grasping. Barbaras puts it this way, “there is no perception without a movement that, so to speak, goes to meet the object, draws its contours, or adopts the angle that allows the clearest view of it. The mystery here is that, although preceding the perception of the object strictly speaking, movement is already adapted to it and ‘knows’ the object before it is perceived.”²³⁹ It is precisely these kinds of statements that seem frankly impossible apart from being able to demonstrate that experiential

²³⁴ Barbaras, ???

²³⁵ Interesting to reflect on Vasquez’s “materialist theory of religion” in this regard.

²³⁶ which I got from Carrie Noland’s discussion of Andre Leroi-Gourhan’s ideas of gesture

²³⁷ Other terminology enter here “attention” and “stopping there” as discussed by Barbaras, pp. 90-91.

²³⁸ Discussed by Barbaras as “tonic” phenomenon D&D p. 88 based on Goldstein.

²³⁹ Barbaras, D&D, 91

neuronal ensemblings must be understood in the rather extraordinary terms where strict temporality does not have sovereignty (tonus and resounding vessel) and where mutually exclusive conditions can be copresent (metastability). What is most important is that while these kinds of statements appear to require seemingly impossible conditions—in this case, that in perception we already know what we are seeking to know, perceive in some sense before we perceive—they actually approach most closely the heart of the matter of living moving perceiving beings.

To understand perception as an ongoing skillful reverberating complex process may help distinguish and comprehend the difference between “groping” and “grasping.” Groping suggests the primal condition of reaching and moving that underlies the more specific skillful and object/other connection of grasping/perceiving. We think of infant groping, we think of “groping about in the dark,” we think of crude imprecise reaching/touching that seeks only sensation (sexual groping has this characteristic), yet without a preceding sense of object. Groping has at best a tenuous relationship to object touched and is characterized by random or crude movement. Grasping, I suggest, is more directed and sensitive and ongoing. Grasping emerges in the ongoing process of experience as a result of the agentive aspect of accumulated experience that becomes necessarily engaged in perception understood as the skillful knowledgeable action of perception. Groping engages only the propensity of experiential neuronal ensemblings as a primal desire of living. Groping is some sense a bootstrap to grasping. Grasping is when this complex process is not simply a propensity, but an engaging of the full capacity of this remarkably complex collection of systems in the skillful art of living. Here is how Barbaras puts it,

In truth, it is *movement itself* that perceives in the sense that the object exists *for* it, in which movement has its meaning, as its oriented nature attests, inspired and clairvoyant with regard to the living movement that often demonstrates an intimacy with its objective, an intimacy that runs deeper than that which knowledge exhibits. In and by movement the object appears, though without its manifestation being separated from its brute presence, according to the indistinctness between its essence and its existence. Here the grasp of the object is not distinguished from the gesture made toward it; perception takes place in the world and not in me, and the object is therefore perceived where it is.²⁴⁰

It is *movement itself that perceives!* The movement transcends the perceiver, moving beyond, to grasp (that is, perceive) the object where it is in the world. And this movement, this perceiving, is living movement, the self-movement that is living, because, as Barbaras puts it, “it is its own source, because it nourishes itself, and because the impulse is not exhausted but restored by its realization.”²⁴¹

Such a remarkable and important transformation of our understanding of perception, yet, for me at least, to parallel Barbaras’s discussion with a description of the biology of self-movement and perception adds depth, richness, clarity, and support.

²⁴⁰ Barbaras, D&D, 91-92

²⁴¹ Barbaras, D&D, 93

There are many other issues that I should cover here, but will save. Based on Bergson's notion of image, Barbaras discusses that in grasping we grasp objects among the totality. His analysis takes him to the conclusion that "it is in its negation that the totality as such is posited, as if the part were to give rise to the whole of which it is a part." 106 The consequence are that it is "in movement itself that the world must be constituted, a world that movement considers as the field against the background of which its negating power unfolds." 106 Very interesting.

Also need to discuss "principle of equivalence" what I call self-othering in Barbaras, p. 89

[Following needs to be integrated with the passage above. Needs major revision: need to combine the moving material (Barbaras, S-J, Massumi, etc.) with the Barbaras perceiving stuff ... Much of this is a chapter from BBM and can't stand here as it is. maybe start with Condillac & Maine de Biran? and the flying man ... self-moving self-touching; should I move the moving/touching conflux piece here as well?]

While there is much to consider in Johnson's work, let me leap into Brian Massumi's remarkable 2002 book *Parables for the Virtual*.²⁴² His analysis immediately focuses on the way we customarily consider movement, which we typically do by examining grids or trajectories, that is, by looking at movement in terms of positionality. Yet he notes "positionality begins by subtracting movement." This observation is a naïve one yet shocking in that we can immediately confirm it in our own experience. Generally, we are interested in place rather than movement. I'll talk about the academic study of religion in this perspective shortly and, as we will see, the almost exclusive focus on place is practically distinctive of the academy. Massumi says that rather than positionality, we "need to grasp movement as qualitative transformation."²⁴³ Not so easy.

Massumi offers more provocative ideas: "When a body is in motion, it does not coincide with itself. It coincides with its own transition: its own variation. . . . In motion, a body is an immediate, unfolding relation to its own nonpresent potential to vary. The relation . . . is real but abstract. . . . To think of the body in movement thus means accepting the paradox that there is an incorporeal dimension *of the body*. Of it, but not it. Real, material, but incorporeal."²⁴⁴ Movement then, while of the body, is virtual as well as corporeal.

Massumi develops on the legacy of Henri Bergson with respect to our concern with positionality. In Massumi's understanding of the primacy of movement, positionality is the result of back-formation. Yet, it has and continues to be our preference to focus primarily on positionality (place) rather than movement or process. Bergson, Massumi holds, turned this upright by showing that position is secondary to movement and derived from it.²⁴⁵ Space/place is then a retroduction, a kind of feedback production, which comes about itself in a new movement.

Comment [SG37]: Review barbaras here and develop these ideas

Comment [SG38]: Need to do this

Comment [SG39]: Yes, most of the following is redundant and can be absorbed above or deleted.

Comment [SG40]: Select a bit to add to "grasp" disc above and delete this parag

Comment [SG41]: Incorporate in phil of movement disc in first ch???? Then drop here.

Comment [SG42]: What to do w/ this

²⁴² Brian Massumi, *Parables for the Virtual*: ???

²⁴³ Brian Massumi, *Parables for the Virtual*: ??? (20??), p. 3.

²⁴⁴ Massumi, 4-5.

²⁴⁵ Massumi, 7. Indicate where in Bergson he is developing.

Perception as Life Skill

Clarity is overrated. Michel Serres calls this tendency to seek clarity “arrogant”²⁴⁶ and writes about simply learning things that we don’t really understand until perhaps decades later when we suddenly realize, “Oh, so that’s what that means!” My experience is slightly different and best exemplified in my reading of Serres (and quite a few others). The works I most love to read are those that I’m quite sure I do not understand much at all, yet I am so excited about the potential in everything I don’t understand. The very absence of clarity correlates with the thickness and richness of the experience. I feel the exhilaration of some sense of understanding that may come years from now. I see it in terms of the theme of the importance of openness, of the gappiness that bears the attributes of movement, the conjunction of desire and distance (Barbaras) or the synaptic gap essential to neurotransmission/action potential. Clarity seems to be the condition of closed gaps and perhaps might be distinguished from coherence, which in its “co-” retains the two together in some bond without collapsing them into clarity; the energy is retained in its co-ness in contrast to the is-ness of clarity. Maturity is in many ways considered the coming to clarity; it is the development in such a way as to suppress the potential to be surprised or the vulnerability to be surprised. Maturity is the surety of having answers; nothing is new under the sun. Whatever one encounters matches to a preset response; the only challenge of maturity is to discern some remote stimulus from a thing encountered and match it with largely pre-set ensemblings.

Youth, and perhaps naiveté, is characterized by flexibility, pliability, openness, colorfulness; the wrinkles have yet to form, the hair to fade.²⁴⁷ I suppose the downside to youth is a certain thinness of encounter, limited experience in the development of neuronal ensemblings. Yet, there is a freshness toward potential; an openness that identifies with energy and movement; lots of bumping around in the world necessary for the innervation that provides a basis for perception. We often recognize that those who are old yet retain creativity as being childlike; of course.

Perception is the skillful connecting of the world of sensation to ensemblings of awareness and response. Perception is always practice involving repetition, yet repetition has its own life cycle, not unlike the human life cycle. In its early stages repetition is the exploration of variations; each iteration adds in its variation to the previous accumulation of repeats. Yet, the variation from occurrence to occurrence tends over time to diminish, necessarily it would seem, and then repetition becomes insinuation, rather than exploration, producing rigidity rather than pliability/flexibility. Isn’t this what happens in organizations or traditions or aging? Take religions, for example. The founding or era of origination engages repetition as remembrance—“do this in remembrance of me”—yet one may see that this remembrance, even if initially so visceral and sensual, turns to stone in time—“do this because the rules/doctrine/law require it and be sure to do it in exactly this way and, oh, also do this in remembrance.” This development doesn’t mean that such acts of repetition do not continue to be valuable and significant, although there is an increasing

²⁴⁶ Michel Serres, (Variations on the Body), 76.

²⁴⁷ These ideas come from Serres who is one of the few I have found that writes in ways I find important about youth and aging. Variations,

propensity toward stagnation; it is often the very marker of our identity; the wrinkle patterns that tell the story of one's past. Yet, the youth, in all their energies and pliabilitys, don't have the patience to read the stories in the wrinkles, seeing them simply as "old," and those most modern, who carry their memories and stories outside their consciousness and their experience in Instagrams and posts, don't see the wrinkles as stories at all ... can no longer even read them.

From many angles I have been trying to show that perception is a vital skill of living. Throughout life we accumulate experience and develop increasingly rich and complex ensemblings shaped by the constant, often routinized, demands on our increasingly immobile style of living. These experiential ensemblings shape the skill base for the artful playing forth of our lives. While the common ensemblings are sensory drenched and have the capacity throughout life to continue to gain refinement, even radical change, they often become rigid; I often think of this as gesturally naturalized. They abide by the same rule of practice for developing skillsets in sports and the arts. We know that we can refine and hone our perceptual skills with practice. Yet, like the 10K-hour rule, it is not mere repetition that amounts to honing and refining, the repetitions require attentive focused effort and constant critical adjustment toward development and refinement. Certainly mere repetition maintains but may ossify; yet critical attention and discernment leads to refinement and growth in skill. The trick is to retain youthful pliability while enjoying the advantages of accumulating experience; some call this living intentionally.

So here then is the challenge that we may accept or not. Engage the perceptual experience of life like a musician learning to play or a dancer learning to dance. Attend carefully to every sight and sound, smell and taste; seek in each experience refinement and nuance of the skills of perceiving and knowing. Adopt as a way of life the honing of the skills of perception that these skills not be simply taken for granted, but that they continue to refine and grow throughout life. Biology. Action and awareness. Individual lifestyle. Tradition.

Michel Serres describes the cultivation of the senses in these richly poetic terms:

There is nothing in the understanding . . . which has first not been in the senses . . . Yet, at the end of the path that began with sensation, sapience gives way to sagacity; I mean by this that, better than leading to the knowledge that is canonized by science, this path leads, in fact, to a refined sense of taste, bestows an exquisite sense of smell and a velvety sense of touch, forms a discerning sense of sight for nuance, a musical sense for hearing for subtle linguistics . . . in brief, fashions a discriminating cultivation or initiates into one of fine arts.²⁴⁸

It seems so easy, so natural, that our faculties of perception are given to us and through them the world simply presents itself to us without much effort on our part whatsoever. Yet, to the degree that we come to appreciate that perception is how we create and discover the world and ourselves as opposed to the world simply pushing itself fully rendered into our presence and knowledge, we will come to find ourselves recognizing the difference between looking and seeing, between listening and hearing, between savoring

²⁴⁸ Serres, *Variations on the Body*, 68-9

and smelling or tasting, between caressing and gripping, between dancing and sitting/slouching.

It is a remarkable notion to consider that our histories and stories are inscribed in our experiential neuronal ensemblings. I love the ideas that we act out of an unfolding story and that we can't really do anything else. In thinking more and more about repetition, I have begun to appreciate that repetition not only has a major role in this story-making story-holding story-playing process, but it also has a life cycle of its own, that is, a kind of schematic for its development. It is the experience of repetition that determines the criteria of synapse. Indeed, experience may reside in no other place than in these synaptic criteria. We commonly consider things repetitive as boring and rigid and oppressive and authoritative, yet I am attempting to rescue repetition as fundamental to the development of skill, habitus, culture, and identity; essential to the basic smooth movement of coherent life. I am beginning to appreciate that both understandings are possible as part of the life cycle of repetition and that these understandings apply both to individuals and to collectives: organizations or cultures or traditions. In early childhood repetition serves the development of basic perceptual and life skills. After early childhood we begin to assume that perception skills are fully acquired (she knows her colors) and rather than conscious repetitious practice of perceptual skills (the constant intentional practice to gain greater color sensory acuity), we compartmentalize such attention to subsets of activities such as in music and sports. We must then allow that the continuing repetition that occurs in perception begins, after early childhood, to take on a different role. Rather than perception being recognized as developmental, that is, purposefully developing perceptual skills, it becomes evaluative, that is, our experience is increasingly measured and evaluated against the "knowledge" (accumulated experience) we believe we have of the world, a knowledge increasingly complete and accurate or so we believe. Increasingly our routinized experiential ensemblings serve to interpret and evaluate the ongoing experience more than the experience is allowed to shape the patterns of the ensemblings. When this occurs, we consider that we "know" and "understand" the world, we are mature, but it must be clear that we have also largely stopped learning and growing, that what we know is being projected on the world. In the terms of Charles Sanders Peirce, abduction is supplanted by induction and deduction (see below in Coherence chapter for fuller development). Instead of continuing to add to the story that is us, our identity, we are living out that story with assurance that the perceived world will conform to our understanding. Adult learners must retain something of childlikeness (a capacity for abduction, surprise) in order to retain the openness of their learning and the ongoing development of their story.

Now I think the same can occur in an institutional context. For example, when people say, as is now so popular, that they are "spiritual but not religious," I often hear them justify their statement by discussing the unacceptable rigidity of "organized religions." Such institutions have perhaps come to that phase when they continue repetitive practices that constitute the story they call tradition, yet they have allowed that repetition, rather than offering opportunity for the continued development of the tradition, to become the rigid enforcement of experience to conform to the story that has become fossilized.

This process can also be understood in terms of comparison. In the early life history of the acquisition of skill/story, an iteration likely offers marked difference between the current

experience and the existing patterned ensemblings based on accumulated experience. The result is an active comparative, negotiative, conciliative process of coordination dynamics that has considerable effect on the shape of the precipitating ensemblings. Yet with each repetition, the complexity of these ensemblings increases as the difference decreases between the resulting ensemblings and the current stimulating experience. At some point, a tipping point perhaps, the pattern of ensemblings may cease to change or be modified much at all and become a rigid grid or lens by which to determine perception; we perceive what we “know” to be there. At this point repetition has the increasing potential to stagnate and limit and overly-shape experience. This trajectory in the functioning of repetition may correlate with such unfortunate designations as maturity and age.

Finally, as I have shown that perception is always a looping iterative skilled gestural memory-involved recognition sort of thing, it is clear that our senses have stories to tell and their stories may keep growing. Indeed, these stories are told as we engage our senses. Seeing hearing smelling all activate the stories of our lives into rendering raw sensation as experience, as “our” experience; as us, our own being. In her book *Color*, Victoria Finlay takes up this remarkable theme in the conclusion of her chapter “Orange” which I discussed above. She quotes one violinmaker as saying, “when you make an instrument you have to respect that you are part of a story.”²⁴⁹ Later she writes in conclusion,

It is the secret of knowing yourself and your materials so well that you can wrap your life’s experiences into the very body of an instrument, just as a true musician puts his or her life experiences into the playing of it, . . . And when both elements are right, then together—maker and musician—you can persuade your violin to sing and cry and dance the orange.²⁵⁰

Yet, isn’t all perceiving a “dancing the orange?”

This story of the orange violin is something of an allegory of the way that we are comprised of the experiential neuronal ensemblings that record in tissue the stories of our living experiences that they might keep dancing. If we could somehow unwind the windings of our ensemblings they would tell the story we call autobiography.

Knowing

Knowing (epistemology) is remarkably complex and has been a philosophical concern since antiquity and it is a prominent concern of modern neuroscience (various subfields including cognitive science). It would be more than foolhardy to pretend any contribution to this vast subject, yet I don’t see how it is possible to consider self-movement and perception without also at least discussing relevant entwinements with knowing.

Knowing and perceiving are complementary poles on a continuum. Neither is possible without the other. Knowing implies retention of the experiential connection with the world through perception. Knowing is inseparable from the retention that I’ve been referring to as accumulated experience. I don’t see how one can consider knowing without some implication that it is retention of experience, experience connected both to

²⁴⁹ Finlay, 199

²⁵⁰ Finlay, 201

perception but also to a history of ensemblings, some of which might be considered in terms of thought. Yet, I fully concur with those who deny that perception somehow creates an interior representation of an external reality. This is why I prefer the implications of experience. Experience accumulates but not as anything like a multi-sensory slideshow or movie corresponding with an objective external world. Experience accumulates through repetition not simply as snapshots, but as the organic influences of relationships and the complexity of ensemblings. While I'm certainly no neuroscientist, it seems that this experience accumulates in the form of the shifting criteria for synapse in conjunction with reentrant processes of coordination dynamics that occur not just in the brain, but also throughout the nervous system including proprioception. What we know does not amount to fixed files of information somehow encoded and stored in compartments (something like file folders or cubbies or even pages on the Internet) in the brain, but rather as accumulating and always transforming tendencies toward organic patterns and associations and relationalities and coherencies, invariably involving metastabilities and nonlinearities, in the brain but also importantly residing throughout the body. We call some of these tendencies toward patterns (that is, ensemblings) memories, some knowledge, others concepts. The ever-increasing complexity (cumulative experience) and organicity (inherent reentrance and degeneracy and coordination) of these potential ensemblings is fundamental to the plasticity and creativity essential to the exigencies of unfolding living as well as to freedom and intentionality and creativity. However, the same qualities make impossible the representation by means of language or any other means of definitive borders and complete objective details of memory, experience, thought, concept. The power of these ensemblings is in their plasticity, their ability to present an appropriate assemblage of profiles to the demands (always connected with self-movement) of present experience. The power of these ensemblings is in their coming and going. One might suggest that knowings that are most successfully "graspable" and "replicable"—I tend here to think of the category we call facts or information—are the least interesting. These knowings are those most successfully captured in external forms such as writing and symbols.

Mind and Consciousness

Perhaps it is a lazy dodge, but I tend to avoid a discussion of knowing in terms of a theory of mind, although I think this approach is currently customary. Perhaps overly naïve here, but in my experience "mind" is too closely aligned with "brain" and the virtual content of brain and thus it is too readily considered a container of memories, concepts, ideas, images, and so forth. Being "in" a container these become entities with the implication of being definable and bound objects, even if virtual ones. I feel that a theory of mind tends to encourage a sense of thoughts and knowledge as objects and as objects to encourage the localization theories so popular to brain studies and especially to popular notions of brains. While I believe that there is medical value to this approach, I think it obscures what to me are the more interesting aspects of knowing; these are its remarkable capacity to near endless processes of ensemblings, to reentrant reorganizations, to the degeneracy that allows endless reticulation, and to coordination dynamics that incorporate both metastability and nonlinearity. None of these characteristics of knowing, of mind, are possible in a localized objectivist understanding.

I also resist the discreteness that is associated with “mind” and “consciousness” as though these are distinctive states or even entities. And they are often understood in terms of contrast: mind is not body; consciousness is not unconsciousness. The gesturally naturalized understandings of these terms invoke the warnings of the Humpty Principle. We can’t get where we want to go because of the location (or assumptions) of our place of departure.

While there has been an enormous increase in the study of “consciousness” in recent years,²⁵¹ my readings on consciousness, although frequently provocative, are often irritating (to me) because it seems many define consciousness at the outset in such a way as to assure the success of the study. So many of these studies feel to me like I am being lead by the nose with an often semi-strident tone that the results are the only ones possible. I suppose my insistence that self-movement is radically primary could be understood, and I think rightly so, as doing the very same thing. I suppose this is what we do, but I think our convictions that drive these kinds of arguments are ultimately based on the lived experience of the author; we argue for what we feel makes the most sense, has the feeling of coherence, has the feel of satisfaction as we pursue it particularly in contrast with other arguments or perspectives.

In my experience of my own consciousness I can’t find any clear distinction and separation of the conscious from the non- or the un-conscious. I know that when I am doing some skilled physical activity like salsa dancing I have little consciousness of the details on which I once (when learning) was so excruciatingly aware that I could barely move. But I am “aware” that these details are still present to me in some sense even as I am engaged in doing them. I know that I am capable of focusing attention on some detail I want to improve all the while engaging in the general flow of improvisational dancing. And in teaching salsa dancing I am constantly stressing to my students that certain aspects of their movement must be so established as constituents of skilled movement that they can cease to be *so conscious or aware of them*. One cannot “dance” when one is conscious of one’s steps and one’s arms and one’s shoulders and one’s appearance and one’s partner connection and the music. Dancing happens when the consciousness moves to the effortless unstudied and unforced streaming patterns of skilled moving/touching, not on each of the details of the many constituents abstracted from movement. Yet, it is my experience that even the smallest of these constituents are not completely outside of my awareness when dancing. We feel and experience the ensemblings that constitute the movement and we direct, if vaguely and in oddly oblique ways, often with intensity—sometimes intensity that is wholly absorbing—the totality of the movement/touching skills we are living/acting/performing. Where is the line there? What is conscious and what is not? What is local and what is global? In my experience consciousness comes in many shades and layers.

And so, too, do these shades color all the processes of our living. Oddly I sometimes suddenly think about what my feet are doing when I am rapidly descending stairs and every time my feet dominate my consciousness in this context I nearly fall. Yet I cannot say that there is ever a time when I am descending stairs that I am without consciousness of

²⁵¹ footnote this from the neuroscience book I think]

descending that includes awareness that my feet are importantly involved. And so too with walking and talking and reading and playing piano and playing basketball and everything I can think of that we do. And sometimes we do some of these at the same time: walking and talking and chewing gum.

The experiential ensemblings approach I am suggesting as the skill base for perception and knowing suggests that it is precisely the blur between consciousness and un- or non-consciousness that is the core of the strength and power of the skill. The importance of understanding perception and knowing as skill is in the attribute of skill, once mastered, to improvise and adjust to unforeseen demands and situations. It is precisely because we don't have to be consciously focused that smooth movement, coherent action, experienced living become increasingly possible and pleasurable. It is that these constantly shifting, unbelievably complex processes of coordination and ensemblings operate at many levels (including levels of consciousness ... more a gradient than a presence or absence) that we can manage to enjoy living and have a sense of intention as well as a confidence in the persistence of moving that is life.

For me consciousness is a gradient of presence and awareness and it simply must include all sorts of feelings from the most focused attention on something very concrete to the most fuzzy and generalized sense of the enormous complexities of constituents that are somehow engaged in my experience and behavior, but the presence is often more like a vague field or impression or awareness that actually precludes more focused attention lest it halt the living action. I rather think that our current obsession with consciousness is a reflection of the current fashion as well as the academic style to backfill and grasp and territorialize. Consciousness is locatable when living ceases.

Corporeal Concepts, Image Schemas, Basic Level Categories, and Metaphors

Maxine Sheets-Johnstone's writings on the primacy of movement include her understanding that basic concepts are acquired in the groping movements of infants; she refers to them as *corporeal concepts*. To place corporeal concepts as fundamental to conceptual acquisition and to all thinking presents an alternative to the intellectualist understanding that we are taught concepts, usually involving language, as abstract intellectual rules or principles. It is broadly accepted that a groping infant begins to acquire distinctions that correlate with and develop based on its movement such as "in" and "out." Sheets-Johnstone argues that the first concept acquired in life is "in."²⁵² Yet, Sheets-Johnstone's contribution is not limited to infant groping. She holds that there is a whole set of "corporeal concepts" that have to do with fundamental relationalities like before-behind, above-below, here-there, me-you, ... that provide the grounding for all other concepts and even the principles of reason itself.²⁵³ While the most basic corporeal concepts correlate with body morphology, that is, that the architecture of our human bodies include a face (and thus a front and back) and feet and head and hands and fingers and opposing thumbs and so on, thus establishing principles and relationships that correspond to the human body universal. However, it is also clear that movement patterns that are culturally and historically and personally shaped correlate with distinct corporeal

Comment [SG43]: Actually read S-J to develop this

²⁵² Stewart??? Enaction article.

²⁵³ Sheets-Johnstone on corporeal concepts???

concepts not necessarily universal to human bodies.²⁵⁴ Gendered bodies, bodies marked by various abilities, bodies of various ages, ethnically marked bodies, culturally marked bodies, and so on may correspond with distinctive corporeal concepts. And it is often the case that the movement patterns associated with these identity markers serve to make the bodies, by way of shaping and toning them in specific patternings, in compliance with the expectations.

Sheets-Johnstone's identification of concept with moving body is convincing and offers a much-needed corrective to the intellectualist bias we so commonly hold related to concept acquisition. We might come to appreciate that the belief that concepts are gained through language and occur as abstract intellectual objects is itself a corporeal concept that arises in a culture that correlates learning with the necessary discouragement of bodily movement. Sheets-Johnstone understood the process of acquiring body concepts as continuing throughout life, as we are self-moving beings throughout our lives. Yet, perhaps her sense of the ongoing continuity of the process throughout life is hampered by her objectification of the notion of concept. For example, when Sheets-Johnstone argues that "in" is the first concept acquired, it seems to imply that "in" is a mental object that has specific and accepted definition and boundaries; that it is a whole mental object (a concept) that can be acquired rather like acquiring a shirt. The approach I have been developing suggests that "in" refers to the clustering, patterning, ensemblings of sets of related experiences. The ensemblings cohere in ways that, from a backfilled retrograde perspective, we label "in." However, our retrograde identification of the ensemblings as a concept "in" falsely limits it, whereas so long as we live, this "in" ensemblings is always and endlessly gaining in complexity, nuance, and extent of interconnection with endless other ensemblings. From the ensemblings approach I am proposing, the concept "in," for example, isn't a thing that can be simply acquired, like a pet poodle or a new hat. A concept isn't a thing with bounded edges that is fully defined or definable. Rather concepts are comprised of experiential resources for and tendencies toward ensemblings that arise based on needs involving the coordination dynamics that draw on vast and increasing accumulations in organic, rather than incremental, form. "In" is always not only relational, but, even as perhaps a seemingly simple fundamental concept, it is always developing and reconfiguring. In Edelman's terms such fundamental concepts as "in" have the greatest accumulation of degeneracy; that is the ability to compound with other concept clusters. "In" as a concept might be understood as something like a constituent technique in a skillset, what in sports and music we call "fundamentals." So, too, with all other concepts acquired throughout life. The value of concepts is not so much in their having clear definition and boundaries as in their ability to interconnect and change based on recombination with other concepts and situations.

It is also likely that these early corporeal concepts are near human universals because they are constructed from human self-movement and human morphology, which are at this

²⁵⁴ I think of Barre Toelkein's fascinating discussion of the implications on worldview of the Navajo use of bundling boards for their infants. He notes that in this use the infant is almost always in a vertical position thus experiencing the world as surrounding one on the same level rather than the world being superior and above as would be the case of infants cradled in a horizontal position. The bundling boards also make groping impossible; that too must have significant implications.

level generally the same throughout the species. We might propose that similar processes occur in non-human animate organisms, because of observable distinctions made in behavior. Sheets-Johnstone would perhaps call these concepts operative in these animals “thinking in movement”²⁵⁵ in ways not unlike what occurs in pre-language human children. Animals with heads move more commonly and easily in the direction the head faces experiencing a preference for forward and toward as distinct from what we would call “backwards” movement experienced typically as awkward and rare. Smooth movement is a core factor. Of course, we would not expect that most non-human animate organisms have conscious concepts mentally identifiable in some ways to the equivalent of “forward” and “backward,” yet it is clear that their organisms are organized with these self-movement acquired distinctive body morphologies being determinative. While horses can and do walk backwards, the thought of a race among horses running backwards is laughable in its awkwardness. The body movement reflects corporeal concepts even if these are not conscious or expressible in any way other than movement.

It is perhaps too easy to confine Sheets-Johnstone’s corporeal concepts to the seemingly, but only seemingly, simple relational concepts acquired in early life through groping movement. By conceding this limited place for corporeal concepts, the intellectualist view can continue to prevail; concepts are things we more formally learn and are taught. Of course we all know that throughout formal education we are regularly introduced to concepts formally stated and taught. While these may appear abstract and independent of either experience or perception, it has been convincingly shown that none of these are purely abstract. Abstract suggests independence from human experience, existing wholly apart from self-moving perceptual experience. George Lakoff and Rafael Núñez present convincing demonstrations of the dependence on experience of the most seemingly abstract mathematical concepts in their 2000 book *Where Mathematics Comes From*.²⁵⁶ They demonstrate that even such concepts as infinity are ultimately based in the iterative process of counting digits.

The necessary use of illustration, exemplification, demonstration, experimentation, application, and proof are evidence that standard pedagogy as well as research methodology recognizes that even the most abstract of concepts intellectually acquired are not independent of self-movement. Even the most abstract of scientific principle depends on external evidence of proof.²⁵⁷ We must try to catch a neutrino, receive a sign from god (like the appearance of god as a human being).

[now Lakoff and Johnson on image schemas and basic level categories]

[Discussion of Category] See Thelen & Smith Ch 6: Categories and Dynamic Knowledge, 161; prototype theory?]

Comment [SG44]: add

Comment [SG45]:

²⁵⁵ Sheets-Johnstone ... thinking in movement???

²⁵⁶ George Lakoff & Rafael Núñez. (2000). *Where Mathematics Comes From: How the Embodied Mind Brings Mathematics into Being*. New York: Basic Books.

²⁵⁷ As I write this the news headlines feature detection of physical evidence that support the theoretical models for the “big bang” theory. I’m always amazed that such scientific findings make international headlines. I noticed that this one included articles on why such findings are of significance to the common reader.

Metaphor is widely understood as a common vehicle for the acquisition of concepts. George Lakoff and Mark Johnson have done much to reveal the extent and depth of metaphor as a powerful method of knowing, extending far beyond the common view of metaphor as a poetic trope. I've discussed metaphor elsewhere²⁵⁸ but to quickly recall the distinctive features here is essential. Metaphor is to understand something abstract (a concept for example) by equating it with something concrete (experienced in self-movement/perception) with the equation of the two being clearly factually false. Metaphor is not the illustration of an abstract by identifying it with a concrete exemplification; rather it is to equate an abstract with something that is entirely not what it is. Metaphor is a kind of metastability. While metaphor theory often describes the mapping of the entailments of the concrete (called the source) to the abstract (called the target) indicating that in doing so the abstract aspects of the target are made accessible by concrete association, I have argued that this kind of one-way mapping cannot be done. A mapping indicates that both map and territory are in some sense already known, otherwise it could be only random connections made by any entailment and some feature of the target. In a sense, as we found in movement and perception, the target must already be known in some sense for any entailment mapping process to be engaged. Metaphor creates a condition of plasticity; a dynamic oscillatory process that fields inquiry and extends implication.

Comment [S46]: perhaps bring htat discussion here.

Comment [S47]: Replace this with that other discussion

Comment [S48]: Replace all this.

Given this brief introduction, metaphor clearly aligns with what I continue to attempt to open for our fuller appreciation. Metaphor is a process of mapping back and forth from one position to the other; a process fueled precisely because it is metastable, that is, it says one thing is another that we know it not to be. Metaphor, unlike riddle and maybe even paradox, is not something we resolve or explain, but rather something we live, something that generates vitality. Metaphor is something we can be made aware (conscious) of, as in ARGUMENT IS WAR. Yet metaphor is something that is most useful to us when it becomes a component of skill, as in the common use of language phrases such as "her statement destroyed his fiercely defended proposition" or "that team clearly won the debate." Lakoff and Johnson's discussion of metaphor in their classic 1980 book *Metaphors We Live By* is so powerful because they show that metaphor lurks in almost everything we say. The lurking indicates that it has become integrated into our skillset of speech and thought. The title of their book reflects something of what I'm attempting to say (far too quickly here) which is that we actually live by metaphors, they are constituents of fundamental skills of perceiving and knowing. As such a metaphor is not a thing, but a metastable nonlinear relationality that has a nonlinear trajectory in that it can find new and unexpected implications and connections as it is repeated and applied and as its associated experiences accumulate.

Comment [S49]: Acgtually extend it ...

Concepts, images, memories, thoughts and all other things of this sort, are ultimately grounded in self-movement. Self-movement is their origination and essential to their value. It is the engagement of the living body in the context of a living environment that gives rise to lived experience that in its being lived reshapes the synaptic criteria and the coordination dynamics to produce propensities of ensemblings that we refer to, despite their amorphous dynamic fuzzy ever-changing properties, as objects including the class of mental objects we call concepts and metaphors. It far more interesting to consider such "things" as propensities, tendencies, processes, patternings, ensemblings always dynamic

²⁵⁸ Elsewhere in this book and also in *Religion: Always Already*

and relational, always inseparable from self-moving, from living moving. And, of course, the labeling and objectifying of these ensemblings is characteristic of the retrograde movement that is connected with language and formal intellection. Knowing is not knowing what, but knowing how.

Color

A few years ago I was decorating a new home I was building. I love colors and spent a great deal of time experimenting with color combinations in the process of selecting colors. The house included a basement that I had designed as a two-bedroom apartment I planned to rent out. Since the apartment was in the basement I wanted to provide some sense of warmth and coziness through color. So rather than choose an off-white I selected a color that was light and had, what appeared to me on the paint chip, the slightest hint of yellow . . . ah, that bit of warmth; a suggestion of sunny light.

I learned that the painters had completed the painting and that the electricians were finishing the electrical, so I went to visit. When I walked into the basement I was stunned to say the least; the basement seemed to vibrate with an intensity emanating from what appeared an electric greenish yellow. The electrician, not knowing who I was, looked up at me and said, "It's kinda intense down here. I don't know how long I can take it." That hint of yellow had, in this environment, turned into psycho-killer electric shocking greenish yellow that would embarrass a tennis ball. I had to repaint.

We have all had similar experiences. Colors change based on the ambient light and adjacent colors and textures and conditions. As we look at the color of a wall in any room we are in, we know that it was most certainly painted a single color from a single can of paint, yet, as we look from wall to wall we "see" lots of different colors. We typically automatically override seeing a variety of shades or even completely different colors and yet, without hesitation, we proclaim it is all a single color, say yellow, yet there are many yellows and how would we go about determining which among these is the "actual yellow" of the room? It works the other way too. If we try to simply paint over a damaged spot on the wall by getting a can of the same color that it was originally painted, it often doesn't match and the new paint (especially if from a different batch) stands out as a "different color." We also experience this if we attempt to paint a realistic picture of a room. Should we use the same "color" on a wall, it doesn't look "natural" so we have to add shades and different colors to get the appearance of the wall to be one color.

We also know that seeing colors, like tasting wine, is something that is impacted by education and experience. Some people have a "better" color sense than others. Interior designers sell their services in part on their "skilled sense of color combinations." We also know that colors are associated with different feelings, but that these connections too vary from individual to individual and from culture to culture and that they even vary over time; recall (if you are old enough) the era of pastels or of avocado appliances and gold shag carpets.

Color is a fascinating topic to explore in terms of perceiving and knowing. We know that some aspects of color experience are closely connected with our biology and thus vary from species to species and we know there are even variations within species like the condition we refer to as "color blindness." We find ourselves struggling to have adequate

imagination to appreciate these biological differences. Our experience of color perception is impacted by endless environmental factors such as light and texture and adjacent colors. This particular complex of color experience is sometimes referred to as the “brightness confound.” We also know that color perception is significantly shaped by cultural expectations and language. It surprises us to learn that what we call “blue” is a color rare in incidence in the world literatures in antiquity. It amazes us as well when we learn that some cultures can easily make color distinctions that we see as simply the same color and that we can make distinctions that seem so clear to us yet others simply cannot distinguish differences among them. Such easily experienced factors raise fundamental questions about color: is it a quality of objects in the world or does it exist only as a quality factor in the interrelationship animate organisms experience with the world?

It is quite clear that color, as we experience it, is the result of a complex set of interactive factors. Color is a quality of thing in the environment and there are more or less objective ways of measuring color in terms of lengths of reflected or absorbed light, yet clearly the perception of color is far from a gauge of this particular measure. Perception of color is shaped in very specific ways by the construction of the eye, the neurological pathways from the eye to the brain, and by the areas in the brain that process the color information. The construction of the eye varies from species to species in a variety of ways say, for example, in the number of chromatic sensors in the design of the eye. But then there are major impacts on the identification of color that correlate with language and culture and history. This variations correlate with the way sensations associated with color are valued by contextual factors thus shaping the way they are experienced and the way the accumulating color experiences are grouped or ensembled. And, of course, there are individual variations in all of these distinguishable areas. Thus accounting for these basic influences on color perception and knowing, color becomes an extraordinarily rich way of considering perceiving and knowing.

Chromacy and the Mantis Shrimp

Color, a phenomenon of sight, has been studied extensively for a long time by many different kinds of researchers. The bottom line for most recent studies is that color perception does not exist in any objective way; color doesn't exist in our experience apart from the action of observing and experiencing it. Color exists as an aspect of the experience of seeing. So how is it that we have names for colors that identify specific hues on crayons and paint chips? Doesn't that mean that “red” is, after all, “red”? Well, yes, but it is not all that simple. We know that color correlates with wavelength in light and that a spectrum of white light is technically an even distribution of wavelengths across the full spectrum of white light. Yet, when we look with our human eyes at this spectrum we see bands with stripes of color that appear to stand out. These bands are especially familiar to us when we look at rainbows. We don't “see” a smudge of colors evenly distributed across the spectrum; rather we see color bands that blend from one to another. The bands are so prominent that we even think of a rainbow as comprised of “bands” of color; most see six or seven. We humans see these color bands simply because the biological construction of

the rods and cones in our eyes²⁵⁹ predispose our vision to favor or emphasize certain wavelengths over others; we see color also determined by the fact that we humans have three chromatic sensors, whereas other animals have eyes with differing number of chromatic sensors. We see red because our eyes are biologically evolved to favor an area of the spectrum with a visible “band” of color we label with the term “red.”

There are important implications here. Color may be objectively correlated with wavelengths of light, although the labeling of colors and their location on this gradient is anything but objective. The experience we have associated with light of various wavelengths is not merely an objective quality of the light; it is, in part, determined by the organ of sight interacting with that light and also influenced by context. Since the relevant biology varies from species to species it is also shaped in a determining way by the specific animate organism. Humans see color in the world as disposed by specifically human visual biological equipment to do so. The world appears the colors it does to us humans, in part, because of the construction of the human eye and the broader human biology of sight.

The studies of color terms, that is the names of colors, across languages reveal extensive variations, yet the core of the color terminology in all languages correlates with the common biological disposition of human color sight. The color of the world is inseparable from the seeing the world; color is a quality of the visual experience of the world.

To appreciate the determinism of our biology with respect to the experience of color, we need only contrast our tri-chromacy with the visual biology of other organisms that differ

Comment [SG50]: It has to do with chromatic sensors. Need some technical accounting of this physiological and neurological process. [I need here to do more on ocular physiology: especially the color sensitivity as it is sent to the brain; think it is red, green, blue]

Comment [SG51]: Expand and be sure it is accurate

²⁵⁹ “Color Vision: How Our Eyes Reflect Primate Evolution [Preview]” Analyses of primate visual pigments show that our color vision evolved in an unusual way and that the brain is more adaptable than generally thought by Gerald H. Jacobs and Jeremy Nathans. Scientific American March 16, 2009

To our eyes, the world is arrayed in a seemingly infinite splendor of hues, from the sunny orange of a marigold flower to the gunmetal gray of an automobile chassis, from the buoyant blue of a midwinter sky to the sparkling green of an emerald. It is remarkable, then, that for most human beings any color can be reproduced by mixing together just three fixed wavelengths of light at certain intensities. This property of human vision, called trichromacy, arises because the retina the layer of nerve cells in the eye that captures light and transmits visual information to the brain uses only three types of light-absorbing pigments for color vision. One consequence of trichromacy is that computer and television displays can mix red, green and blue pixels to generate what we perceive as a full spectrum of color.

Although trichromacy is common among primates, it is not universal in the animal kingdom. Almost all nonprimate mammals are dichromats, with color vision based on just two kinds of visual pigments. A few nocturnal mammals have only one pigment. Some birds, fish and reptiles have four visual pigments and can detect ultraviolet light invisible to humans. It seems, then, that primate trichromacy is unusual. How did it evolve? Building on decades of study, recent investigations into the genetics, molecular biology and neurophysiology of primate color vision have yielded some unexpected answers as well as surprising findings about the flexibility of the primate brain. See also <http://webvision.med.utah.edu/book/part-vii-color-vision/color-vision/>

and, in doing so, attempt to imagine the experiential difference. Certainly we might begin with simply the notion of “color blindness” which occurs relatively commonly in human men. **DEVELOP** We might also search as scientists have for those rare humans who appear to have quad-chromacy. **DEVELOP**.

Comment [SG52]: Color blindness

Comment [SG53]: 4 chromatic sensors

Yet, to boggle the mind and make the point in spades we might consider the Mantis shrimp. This amazingly beautifully colored (even in our own limited chromatic capabilities) animal has many biological characteristics that are remarkable. The one I want to focus on here is obviously the chromatic sensitivity of Mantis shrimp eyes; their eyes have thirteen chromatic sensors. The challenge for us humans with only three sensors is to catch anything like a glimpse of how the Mantis shrimp experiences the color of the world. Perhaps one small step would be to think of the progression from black and white, to sepia, to bi-chromacy, to full tri-chromacy. We can experience all of these and the remarkable difference in how the appearance and character of the world changes across these shifts in chromatic sensitivity. It is frankly difficult for us to take even the next step to quad-chromacy. How can we imagine adding whole ranges of color experience that we simply don’t, and can’t, experience now? I’m reminded of a congenitally blind student that took a class from me years ago in which we discussed color. He said, “I’ve always heard about color and the names of colors, but frankly I have no idea at all what color is.” Surely we must be in the same situation when it comes to comprehending how the Mantis shrimp experiences the color of the world.

Comment [SG54]: make sure this is correct

One analogy that I have experienced is the correlation of chromacy to sound.²⁶⁰ The connections between color and music have been made often since antiquity. A three-note chord then represents tri-chromacy. Nice and harmonic. It may be even more interesting if we think of adding not only a new note, but also a new instrument. Then we can hear the vast enrichments that arise as a forth and fifth and so on tones/timbres²⁶¹ are added with the effect moving from a trio to a symphony. The sound analogy is helpful as well in that adding a new sound does more than add a new note; it changes the entire harmonics. This sort of interactive implication would be present in chromacy as well. This analogy provides some sense of the scale of change, but I think we continue to be pretty much unable to imagine the color experience of the Mantis shrimp.

The importance of this example is that our experience of the world—that is the accumulation of memory, images, concepts, and so forth based on experience—is determined, in part, by species-specific biology. The world is present to us as a colored world to experience in qualities that are enabled by and limited to our specific biology of vision. The color of the world is constructed, in part, by the human eye’s predispositions toward discerning colors. As these experiences of color accumulate they are available through the biological processes of coordination and ensemblings that form the skills to both perceive the colors we experience as well as to negotiate the remarkably complex sensory data that pertain to color. For this aspect of our accumulating skills of knowing and perceiving color we need to consider what is commonly referred to as the brightness confound.

²⁶⁰ Refer to Radio Lab program.

²⁶¹ The term timbre is interesting in that it is often described as the “color” of the sound.

Brightness Confound

Some time ago I acquired the Lightroom version of Adobe Photoshop intended primarily for editing photographs. My first experience with it was to edit a bunch of photos of my granddaughter dancing at a competition. I bought these photos from the event hosts because they didn't allow photography other than their own. The issue with the photographs is that Fatu's brown skin and black hair disappeared against the black curtain background and Marley floor. Lightroom has remarkable abilities at resolving these issues in a photograph and also so much more. As I started working with it I went through a number of tutorial videos to learn how to use the various "tools." There are a couple kinds of adjustments for "white balance"—temperature and tint—then there are many settings for the classic three Newtonian color distinctions—hue, luminance, saturation—each adjustable for eight different color names, and there are six variables that can be adjusted for tone, including exposure and shadows and highlights. There is another set of three color factors called "presence" including clarity, vibrancy, and saturation. These are just the basic adjustments that are associated with and impact the color appearance.

What I quickly learned when I started working on a photo is that the smallest change in any direction to any one of these many adjustments tends to have a global impact on the appearance of the colors of the image. One might naively think that all of these adjustments are separate, each with an isolatable impact analogous to say physical adjustments in height, width, depth, thickness. While I am quite certain that the software has an algorithm that is connected with every number, positive and negative, for every one of these many adjustments, when we use them we cannot "see" a specific and isolatable factor, like a change in length, as the result of a change in this factor. Almost every adjustment seems to have a global impact on the color and appearance of the image.

In the simplest case, which is what Brian Massumi talks about as "the Brightness Confound,"²⁶² when we increase brightness all of the colors that we "see" change; indeed, in my experience when brightness is increased (by one of several means in Lightroom) often colors appear where there were none visible before. This effect is interesting in the photographs I was working on, because by making certain adjustments colors simply appeared where there was only black before. One has to comprehend that the color has to exist in the photograph (just not visible because of the brightness), but these colors could only be seen as brightness is varied. And then surprisingly the color varies quite significantly based on the level of brightness. This was easily the case in these pictures that I was editing of my granddaughter, Fatu. Increased brightness, achievable in different ways in Lightroom, introduced color where there was no "observable" color before and different colors based on different levels of brightness. Brightness is then, as Massumi holds, in a confound with color. We experience this in nature as well. Seeing at night often leaves us with shades of grey and maybe some dark colors like maroon and brown and indigo. Yet, when the sun comes up we begin to see all sorts of colors. Were they not there all along? And should we be able to continue to increase the brightness we will experience that the colors eventually begin to wash out or fade in the brightest light. The brightness confound.

²⁶² Massumi, *Parables for the Virtual*,

Let's think a bit about this term "confound." As Massumi suggests, we tend to take the term negatively as in "I'm confounded by that situation," meaning confused irritated annoyed bewildered puzzled presumably because of the complexity of interconnections that cannot be separated. Some of these meanings are perhaps appropriate in trying to make the adjustments necessary to get a color result by making various adjustments in Lightroom (or in my basement apartment!). But Massumi reminds us that the term means simply "found together" and that William James used the term "conflux" and Deleuze and Guattari communicated something similar using the term "block" when referring to experience.²⁶³ I've suggested the term "experiential neuronal ensemblings" in the effort to show that the brightness confound is inseparable from the ongoing process of accumulating experience in service to skillful acts of perception and knowing. This ensemblings process allows us to identify a car in the bright morning sun and the same car at dusk as both being the same color because of the accumulation of experience of seeing an object appear differently under different brightnesses. To press this example a bit, if color vision were absolutely objective, we would have to conclude that the "red" car at noon is a different car than the "maroon" one at dusk and the "black" one at midnight. I'd suggest that while we see that the car has different colors associated with it based on brightness confound, the make, location, and other factors "trump" the color appearance in the experiential neuronal ensemblings process so that we "know" based on the accumulation of our experience that the car is "red" and we might even report the color of the car as "red" even when seen at midnight. I say "might" in the previous sentence because "focus on color" might trump the ensemblings process as well. For example, if in this very discussion where we are hyper-focused on color perception I were to ask, "so what is the color of that car you see there?" referring to the same car we have been observing all day in a discussion of color confound, I suspect one would likely say "black" or "maroon." With this hyperfocus one might add qualifiers like "it *appears* to be black." In a quotidian situation, we actually "see," that is experience, the color as adjusted by the experiences we have accumulated regarding how color sensation changes in terms of brightness confound, but also by the exigent demands that shape our perceptual processes. To follow the implications a bit further, the color of this car is then a metastability in being at once "red" and "maroon" and even "black." Based on the resources of our accumulated experience as constructed and held in neuronal ensemblings the copresence of three colors for a single colored object is not the basis for a world with no coherence, but rather is the very basis for the world to be experienced as coherent. And, pushing just a bit more here, this same car might well be "orange" if parked next to a yellow wall; thus color has nonlinearity in changing unpredictably based on its ongoing interactions. Our ensemblings processes skillfully (which means an accumulating profile of experience) adjust to keep the world coherent, even as it is faced with constant threat of incoherence; I'll develop this idea more fully in the next chapter. What is to me most interesting is that what Nicholas Bernstein (??) studied in terms of freedom of movement correlates with the experience of color. Red can be red or orange or black or maroon, the color ultimately related to the dynamic relationship. Surely we must begin to appreciate that, as founded in self-moving and touching, all our senses comprise a block, a confound, a conflux, an accumulation of experiences suggesting that, to a degree, there is no autonomy of any sense, but rather all of the senses, as with colors and brightness, are

Comment [SG55]: specify

²⁶³ Massumi, Parables, ??

friendly and collegial and interact as a community of chameleons, each changing when interacting with one another's traits.

Massumi writes, "colors are convivial by nature. Deprive them of company and they 'blank out.'"²⁶⁴ He is pointing out that not only is color/brightness in a confound, but color/color is in a confound. Colors are friendly with one another and in the company of different friends (colors) they appear differently. We know this in fashion terms when we consider that some colors "clash" with others, but then this is really why we call it fashion, because in some cultural milieus the same color combinations can be considered quite attractive. Still, colors interact with one another and by changing one color other colors appear to also undergo color changes. And it gets all the more complicated when we consider the classic three dimensions of color articulated by Newton—hue, brightness, and saturation. Massumi helps me understand my experience using Lightroom when he writes of these dimensions, "they are not what is actually seen. They are abstract tools for seeing something else, which does not present itself directly to the investigator's experience. They are abstract entities serving for inductive analysis."²⁶⁵ By "actually seen" I'm supposing that Massumi is referring strictly to the wavelengths of the light striking the retinae, to raw sensation. In Lightroom one simply has to try out a change in some variable and observe what results to the overall effect. This too becomes gestural, for as one gets the feel of these movements in color adjustments, one comes to sense what to do to get the desired results that are not describable, only approachable.

Massumi also holds that color is in a confound with texture and taste, evidenced, he suggests by the way we name crayons and paints in English. By labeling a color buttery yellow or mango or spicy applesauce or lime or almond or toast or brick or Valentine red or cardinal red or sky blue, the color experience is, in part, actually created in the confound, the block that includes our accumulated experience with these associated textures, foods, tastes, objects. We likely wouldn't name a commercial paint color "puke" or "bile" or "urine" or "snot" or "puss" or "piss" although we often use such terms as a critical comment on the color taste (interesting confound itself) of others and even as designations for the color of something; it usually carries judgment as well as a distinct hue as in "I can't drink that soda because it looks like piss." The point here is that color is bound in and emerges from "blocks" of accumulating and associating experience or "confound" in which colors are inevitably and inseparably part of objects, textures, histories, associations, and so forth. Massumi quotes John Lyons, who has written extensively on color, as writing that "Colors . . . as we know them are the products of language under the influence of culture."²⁶⁶ Language and color are significant parts of the story.

Massumi quotes the philosopher [Ludwig Wittgenstein](#) in his discussion of "the brightness confound." In his "Remarks on Colour" Wittgenstein wrote,

In my room I am surrounded by objects of different colors. It is easy to say what color they are. But if I were asked what color I am now seeing from here at, say, *this* place on my table, I couldn't answer; the place is whitish (because the light wall

Comment [S56]: Isn't it Ludwig?

²⁶⁴ Massumi, *Parables*, 163

²⁶⁵ Massumi, *Parables*, 167.

²⁶⁶ Quoted in Massumi, *Parables*, 171.

makes the brown table lighter here) at any rate it is much lighter than the rest of the table, but, given a number of color samples, I wouldn't be able to pick out one which had the same coloration as this area of the table.²⁶⁷

Then Massumi comments, "The philosopher, staring pensively at the table in front of him, begins to unsee things, things he has seen and the color of which he knows. When he looks more closely, he notices that there is a gap between what he has *seen* and his *seeing*."²⁶⁸

Massumi's concern is pertinent to all perception I think. He reminds us that when we focus carefully on what we see that we label a "brown desk" engages us in a process in which we "unsee" the uniformity of the brown and begin to see a whole range of color-ishes (Wittgenstein calls them colorations) that we can't even seem to match with color samples. The concern is, as Massumi puts it, that we cannot simply ignore these anomalies because the color-ishness of things is what we are *actually* seeing, at least in terms of raw sensation. Later Massumi holds that he believes that infants' visual experience is more simply that of what we "actually see," that is, this color-ishness of raw sensation, and that it is only through cultural and language experience that this seeing undergoes the shift to see what in fact is a construct, even if it is something we actually experience as quality of object. We come to see this object before us as a brown desk, no -ishness about it. What I believe to be of utmost importance is the cumulative effect of experience in our "experiential neuronal ensemblings." It makes sense that with little or no experience—the construction of a profile of experiential expectations based on extensive iterations of associating raw experience with language, past experience, cultural expectation, experience of how sensation changes related to change in light, and on and on—we would "see" something less filtered and in a sense more objective (what Massumi calls "actual"). Those who would insist on "objectivity" as the overriding factor in ensemblings would discover the disadvantages of objectivity when attempting to find their car in a parking lot that when parked at noon needs to be identified at dusk; objectively they would appear to be different cars, similar in shape and model but different in color, thus objectively a different car. Such persistent objectivity of perception would lead to a world with very little coherence. Perceiving and knowing are inseparable from skillful relationships between perceivers and the perceived.

Key, in my approach to all this colorfulness, is that we need identify and understand the mechanism by which these color perceptual abilities are shaped and retained as the basis for the skill we exercise in the act of perceiving color. Clearly, as I have been developing it, these skills and knowings are based in movement and touching, the proprioceptive groping shaped and directed by culture through language and pedagogy that, enforced by extensive repetition, create complex experiential neuronal ensemblings (profiles) that enable coherent perceiving and knowing. Further every contemporary experience of perceiving and knowing enriches and hones and informs the skills of perceiving and knowing; it is an ever-ongoing process.

²⁶⁷ Quoted in Massumi, *Parables*, 162

²⁶⁸ Massumi, *Parables*, 162.

The Ganzfeld: Pure Vision, Seeing Before there is Anything to See

Another fascinating topic, the Ganzfeld studies, relates more directly to vision specifically than to color vision. It arises in pursuit of that persistent effort to isolate some objective grounding to vision itself, some way of comprehending “pure vision” unsullied (in this approach) by experience of seeing some specific things. In other words, seeing before there is anything, any objects, to see. For decades, experiments were devised around presenting to research subjects a field of vision without objects. The subject was to report on the experience of a “total field” or Ganzfeld. Now, to me there is fatal flaw apparent at the outset if one accepts that experiential neuronal ensemblings occur throughout life shaping perception skills increasingly over time. Since these skills are fundamental to perception and inseparable from one’s very tissues (neurons/synapses/proprioceptors), they cannot be subtracted by experimental procedure. While one may be able to manipulate a laboratory procedure so that a research subject experiences a total field—solid unchanging light without any discernable objects—it is not possible to eradicate the accumulated experience of a lifetime of seeing (even for the very young) nor the powerful ensemblings processes that engage remarkably complex coordination dynamics to provide a skilled response to any and all raw visual sensations. Still, given my concerns about the experiment let me continue to discuss this Ganzfeld effort because it leads to some interesting results.

[Also since Ganzfeld has now become more of a method for hallucination than for vision experience, I need to develop a much better history of this procedure. I also need to find Massumi’s sources on this because it is his reporting that reveals that Ganzfeld is linked with movement.]

Comment [SG57]: Add this to what follows

In an effort to find a visual field that would serve as the objective ground for vision, scientists in the 1920s developed methods to document what they called Ganzfeld, or “total field.” The notion was to find the field of sight before any object was available to see. How they did this was rather ingenious. Today, as I look at the many YouTube videos on contemporary versions of this procedure, it seems to be a little technique some now use for a legal and cheap hallucinogenic experience.

Before I describe the procedure, I want say a bit here about this whole notion of a ground or a total field or a pure field. It seems that humans have evolved to expect a ground that will provide a place of stability. That such a condition is termed “ground” may offer some hints for us. Ground is always paired with movement. As we move about the world we move relative to a ground that offers stability and orientation. We seek firm ground, stable ground, a firm place, a rock rather than sand on which to build our house. In terms of cosmology, for centuries it was believed that an *ether* existed as the ground against which the planets and stars and heavenly bodies moved.²⁶⁹ Even with the rise of quantum mechanics and relativity physicists seek a unified physics, which suggests in general terms a single grounding for both. In his study of religions, Mircea Eliade, proclaimed that religion is distinguished by the identification of centers (meccas and mountains and poles) that offer a firm orientation or grounding or world axis (*axis mundi*) as they also identify the temporal equivalent of beginning or origination. Theologies commonly understand

²⁶⁹ I’ll deal with this ether more fully later.

theos as a being presence; as the beginning and the end, the alpha and omega. In antiquity Archimedes said, “Give me a place to stand on and I will move the world.” In my research on various aspects of ground, place, center, origin, being presence it seems to me that we have had a tendency to seek the grounding so as to stop the movement rather than to appreciate and comprehend the vitality inseparable from movement itself. We have sought our place that we might have answers and understand meaning; that we might reveal the truth. We seek to be centered or balanced or grounded that we might be powerful. Science and religion are much the same in desiring solid grounding, a dependable place. The need for place is a culturally and historically (thus gesturally) shaped understanding of posture.²⁷⁰

Comment [SG58]: Is this correct?

What I have come to understand and to pursue is that grounding is of interest only in terms of movement, of enabling and comprehending movement as it is moving. It is the moving that is essential because movement is life, vitality. I think we’ve commonly had it backwards; we have paid attention to the least interesting aspect. Ground and movement have a copresent implication.

I’m reminded of a study I once read about of the designs on Hopi kachina sashes. These are sashes the Hopi men dancing as kachinas wear as a standard part of their costumes. It wraps around the waist and hangs down one side of the body. Symbols are embroidered on the part of the sash that hangs down. Apparently an anthropologist became interested in these designs and began interviewing Hopi dancers to identify the symbols to come to understand what each refers to and might mean. He asked a number of Hopi in his attempt to get a full accounting of all the designs. Coming to the end of his study he casually ask a Hopi person he was talking to if he thought of anything else that might be relevant to his study. The Hopi man reportedly asked the man why he had never asked anything about the sash, because were it not for the sash none of these designs could exist, they would not dance, he said. The ground and the movement implicate one another.

What is the painting we call vision before any paint is applied to the canvas? What is the world or the cosmos before anything exists? What is vision before anything is yet seen? This is the condition sought in the Ganzfeld studies, at least as I understand them. Yet, as the Hopi man’s comments suggest, it is not the halting that is what is fundamental but the connection with dancing, with moving. The richer view of copresence might be understood in the terms of Merleau-Ponty’s “pure depth”—that is the copresent implication of “here” and “there,” the distance before there is any separation. It is the copresent implication of movement, in that moving invokes the same pure depth, the copresent implication of here and there, joined, yet never bridgeable.

Understood as “pure vision,” Ganzfeld, total field, is then the field of vision—a seeing something here that is there, yet before there is anything there to be seen—before sight distinguishes an object as something seen. Ganzfeld is, in Merleau-Ponty’s terms, to perceive depth itself. How to do this? The approach taken in the Ganzfeld studies was to isolate the physical and physiological conditions of vision in order to discover the elementary nature of visual perception. This was understood in the simplest form as white (or full spectrum) light striking the retina. This, as I’ll discuss later, assumes an

²⁷⁰ See forthcoming *Gesture Posture Prosthesis*

instrumentalist view of perception; that is, that seeing is accomplished principally by a sensory instrument, the eye, doing its thing. The technique used to try to isolate this “seeing” in the most fundamental sense, that is, seeing in some pure sense before any *thing* is seen, was to expose the retina to full spectrum light with no image. This would be to test elemental seeing, the basic pure sight from which all object vision arises. The Ganzfeld studies devised attachments to cover the eyes resembling half Ping Pong balls. The subject was in a controlled environment of isolation, that is, no ambient stimuli and a steady white light. The subject was placed in this situation for varying lengths of time. What did they see? What was their visual experience? The results were largely unexpected.

Subjects generally found it difficult to express what they saw. After a period of time experiencing the Ganzfeld many could not tell whether their eyes were open or closed. For some subjects vision seemed simply to blank out. Some described it as a complete absence of seeing. There were also common after effects for subjects. Most felt fatigue and a lightness of body. Many suffered reduced motor coordination, a loss of balance, and poor coordination. Many felt dizzy or intoxicated. Typical was a temporary state of depersonalization.²⁷¹

Researchers concluded that the “total field” was not a phenomenal field, that is, a field that could be experienced. The Ganzfeld was thought of as “an anomalous event befalling experience—that is, it pertained to experience but couldn’t be said to be experienced.” Brian Massumi, reflecting on Ganzfeld, wrote, “Under its purest empirical conditions, vision either fails to achieve itself or falls away from itself—and from the self. The empirical conditions of vision are not only not able to be held onto in experience, they prevent experience from holding onto itself.”²⁷²

The next stage in the evolution of the studies was when researchers began to think that “natural vision” is never pure, but always occurs in conjunction with other senses. That is, vision is synesthetic. They added controlled ambient stimulation like “white noise.” The results produced hallucinations. And the recreational Ganzfeld methods today play with these factors.

So what do the results of the Ganzfeld experiments tell us? Pure vision, so far as these studies can present it, is indistinguishable from visual chaos, a randomness out of which object vision “may,” but does not, emerge or has not yet emerged. This most objective visual experience produces abstract space or a space-like abstraction. Pure vision might be thought of as pre-vision, a tendency toward seeing, a desire that an object of vision might emerge from this abstract space. Pure vision is a longing or desire that philosopher Renaud Barbaras understands as characterizing living movement, that is, both the sense of distance, a separateness, and a desire or expectation, a getting to there from here. Subjects often referred to their sort-of experience of Ganzfeld in movement terms: “a fog coming up” or “a white you could go into.”²⁷³ We can feel this motion as we imagine ourselves in the Ganzfeld environment: the objective pure vision is only vision-like if it is tending toward something that we can “see.” We feel the urge and desire to move or to experience

²⁷¹ As reported in Massumi ... need to find original source

²⁷² Massumi, *Parables*, p. 145; read other sources

²⁷³ Reported in Massumi ... get source.

something move, in any imaginable way, to the limit that allows object vision to emerge. It is our movement that gives rise to the possible experience of seeing. As Massumi writes, “It is the movement of our bodies that operates the selection. Every move we make is an existential pressure cooker bringing forth vision from the vacuum.”²⁷⁴ We can appreciate that seeing beings subjected to the Ganzfeld have an expectation of sight and in the absence of anything seen, they will begin a proactive effort to see. Seeing becomes looking, looking for, which amounts to moving the eyes about the field seeking edges, movement, distinctions.

How does the Ganzfeld apparatus give rise to the proactive “looking” beyond the passive “seeing?” Importantly, looking suggests that we possessors of eyes come equipped with an awareness that eyes exist to see and that there is a proactive dimension to seeing, that is, a looking that we might see. Proactivity is based in movement. We look about for something to emerge, to arise; we sense ourselves entering into the foggy field in search of something, something visible. We anticipate seeing in the very act of seeing. Secondly, sight is gestural in that it is constructed through repeated experience. It is the link to proprioceptive activities that visual object distinctions are constructed and established; the bodily experience in the world builds up our capacity to see color and object. Any raw optical sensation engages the experiential neuronal ensemblings that skillfully evaluate, construct, identify these data that we might experience sight. The Ganzfeld procedure cannot remove or somehow eliminate this process, yet when the process is limited by the absence of any sensory triggering data on which the ensemblings process can discern/concoct object of vision (contemporary visual experience) visual ensemblings are confounded. It seems appropriate that the frustration of this ensemblings process would lead to an experience that aggravates even the assurance of it being visual. Take away all possibilities that can trigger and motivate experiential neuronal ensemblings and the complex skills that comprise vision are initiated yet without the necessary external stimulus to allow the skills to be exercised. The result is that the skills can only exert agency to search out or to anticipate anything that will allow them to function. No wonder it is experienced as tiring and depersonalizing.

Interestingly the introduction of “white noise” provides a cross modal input that the experiential neuronal ensemblings will eagerly grasp to manufacture ensemblings out of random stimulation. Literally using any bootstrap potential to invoke and ensemble raw visual stimuli into some semblance of visual experience; it can only be hallucination. Quite amazing. So many implications of the Ganzfeld.

What we have then to think about is that the closer we get to “pure vision” that is vision that is not influenced by anything subjective (by any accumulated experience), the greater we begin to appreciate that visual experience, object vision, is interdependent with the history that distinguishes us, including the entire accumulation of experience, as moving beings—and, indeed, moving human beings—in relationship to our environment including, but extending beyond, mere visual stimuli. Self-movement is primary to vision; experience is primary to vision. Vision is actively interrogative.

²⁷⁴ Massumi, *Parables*, 148-9

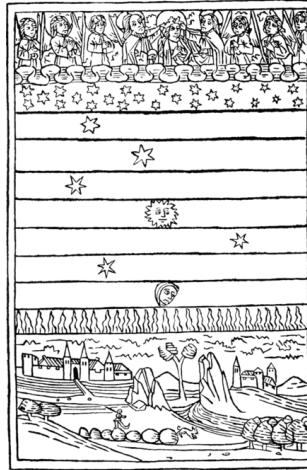
Sky Blue

Let's try a little challenge; how is it possible to see something that just is not there to see; something unavailable for our moving/touching proprioceptively gained accumulation of experience into experiential neuronal ensemblings. The challenge is to come up with something, anything, that we can "see" without it being ultimately based on some experience of moving/touching. How about the sky? Fun; with surprises.

So what are we looking at when we say we see the sky and think that we are seeing something? That depends on where we are located. If we are standing on the surface of the earth, as is most common for us, we are seeing the effects of the light passing through the atmosphere. The atmosphere isn't something that offers itself up as an object for us to see; that is, the atmosphere doesn't have a visible surface or shape, but it is material and serves to reflect and filter light in predictable ways. So the first thing to say about seeing the sky is that even from the earth's surface, the sky is not an object that can be seen, any more than we can see air, which is what it largely is. We typically don't say, "I see air," so why do we say, "I see the sky"?

I'll get back to this in a moment, but first let's explore this "from where" issue further. If I am a space cadet on a spaceship outside of earth's atmosphere, then I don't see anything. There is no up or down and objects that might appear do so amidst blackness, empty space; a Ganzfeld of another color. Space cadets still might call this visual experience by the term "sky." Yet, the referent to this term is now not something seen, but the absence of anything seeable. The sky in space beyond the atmosphere is simply the absence of light, total darkness, because there is nothing to diffuse the light passing through this space. It is a near vacuum. From beyond the atmosphere the sun does not appear yellow in color; it appears white since it is full-spectrum light.

Of great interest to our present concern is the notion that from a perspective of seeing what we might call "the sky" outside the earth's atmosphere we more often refer to it as "space," that is, the space in which things move about and exist. Indeed, even from the earth we think of the sun and planets "moving across the sky" or stars being "in the sky." This is an ancient idea; that is, the idea that the sky is the stable ground against which other things move. This idea dates at least from Aristotle's optics theories based on his belief that light simply could not travel (that is, move) through empty space. He proposed a subtle "ether" or material that served as the stable ground allowing everything else, including light, to move. In Greek mythology "ether" was a synonym for "sky;" a meaning that persists in the word "ethereal." Philosophers and physicists discussed the idea of an ether regularly until the late nineteenth century focused on the issues of properties such as permeability and permittivity (which has to do with the existence of an electrical field in a material). Interestingly, in all these concerns the fundamental issue has actually been movement. Can



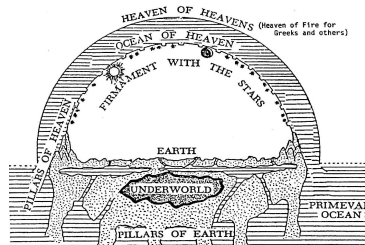
movement occur without a ground against which something can move? The assumption of the ether is that anything moving must be touching something to allow it to move along rather like an automobile needs contact with the road to move. If one jacks up a car it cannot move even if the wheels are turning because it needs a road/ether or ground against which to move.

Thus from the time of Aristotle the sky was the focus for one of the most fundamental concerns about how we understand the nature of the universe. Is it built on some stable ether that allows all else to move by their subtle touching of the ether or does existence have no permanent stable grounding at all? We can see why gods are traditionally located in the heavens, because, in a religious realm, they serve as the stable ether, having existed before creation. Creator deities are often the prime movers; all things exist as movement relative to or set in motion by them.

Still, we consider the sky an object, we do refer to something when we use the term, and this something has some visual attributes. The questions then become how is this possible and how does it work? We can get some clues by simply asking what we mean by the word "sky" when we use it and also asking when and how did this language use come about and has it always been the same? These are interesting and important questions.

We use the terms "sky" in a number of ways. Most commonly we use it to indicate the region of the clouds or the upper air or atmosphere of the earth. In this usage, the sky is above, but at a distance above human reach. This is interesting considering our concern with seeing something that isn't connected with touching or movement. In perhaps a slightly more grandiose sense we consider the sky as referring to the "heavens" or the "firmament." Such a use remains common today, but it clearly has a more historical feel to it. It suggests the location of the gods or the heavenly beings. The firmament is the sky, often conceived as a solid dome, although the depiction (as illustrated above) dating 1475 is a layered arrangement. According to Genesis, God created the firmament to separate the "waters above" (the source of rain) from those below (in the underworld). It has religious associations and in this usage it is commonly depicted as a great arch or vault. This is the notion of the sky being this great dome or roof arching over the earth with perhaps the stars scattered across it. This is an old and classic use of the term. In this part of the story the sky is populated with superior beings and with the celestial bodies. It is given physical as well as spatial existence. The distinction ABOVE-BELOW and the value associations incumbent on placing god in the heavens is based on the metaphor constructed variously as ABOVE IS BETTER or ABOVE IS ETERNAL or ABOVE IS GODLY. The basic distinction ABOVE-BELOW is, as Sheets-Johnstone and Lakoff and Johnson and many others have shown, based on the human bodied experience; it is a fundamental human-dependent orientational corporeal concept.

From our space traveling modern scientific knowledge we can think of this sky dome or vault as an oddly old fashioned construct to explain something that those folks of the past simply didn't understand. But then, we can also appreciate that this image is from a



chapter in a story, our story, we are still telling and creating and that this story, embedded as proprioceptively etched experiential neuronal ensemblings is creating what we are seeing. We still speak of the sky as the heavens and as the firmament and do so without thinking we are saying anything fanciful.

Let's not stop here, because the story continues. When we consider the etymology of the word "sky," we discover that it traces to "early 13c., 'a cloud,' from Old Norse *sky* 'cloud,' from Proto-Germanic **skeuþam* 'cloud, cloud cover' (cf. Old English *sceo*, Old Saxon *scio* 'cloud,' Old High German *scuwo*, Old English *scua*, Old Norse *skuggi* 'shadow,' Gothic *skuggwa* 'mirror'), from PIE root **(s)keu-* 'to cover, conceal.' Meaning 'upper regions of the air' is attested from c.1300; replaced native *heofon* in this sense." PIE refers to Proto-Indo-European languages. The etymology of the term suggests that its recent meanings have indicated a cloud. This is an interesting twist to our challenge, because clearly clouds do have some material existence and we might then ask aren't clouds something one can see without any concern with touch or movement. Yet, the term "sky" when referring to cloud has a clue here as to how they are visible. The Proto-Germanic term referred to "cloud cover," the Norse to "shadow," the Gothic to "mirror," with roots indicating "to cover," "to conceal," or "to hide." All of these suggest movement of objects relative to one another. Then around 1300 CE this term apparently also began to replace, or more likely supplement, the term *heofon* or heaven, bestowing the religious conception of the multi-layered universe onto the term and serving again to bestow on it a sense of being a physical place. We find this confirmed in the etymology of the term heaven: Old English *heofon* "home of God," earlier "sky, firmament," probably from Proto-Germanic **hibin-*, dissimilated from **himin-* (cf. Low German *heben*, Old Norse *himinn*, Gothic *himins*, Old Frisian *himul*, Dutch *hemel*, German *Himmel* "heaven, sky"), perhaps from PIE root **kem-/kam-* "to cover". [Watkins derives it elaborately from PIE **ak-* "sharp" via **akman-* "stone, sharp stone," then "stony vault of heaven"].

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In the late nineteenth century physicists Albert Michelson and Edward Morley attempted to measure the presence of the ether relative to the movement of the earth. Their famed 1887 experiment appeared to fail because these physicists believed they were measuring something that existed however subtle, ether. Later, in 1895, it dawned on the physicist Hendrik Lorentz that the failure of the Michelson-Morley experiment actually established that the long assumed ether does not exist and from this recognition physicists began to pursue a physics based on this new knowledge. Not long after this result was used by Einstein to refute the existence of the ether and allowed him to develop special relativity without this artificial (and non-existent) constraint. Modern quantum physics arose in the context of the story that for millennia was bent on understanding how light and other particles could move across the sky. It was based on Aristotle's assumptions about movement and touching: things can't move without moving along something that enables their movement; that there is a stable grounding for movement in the universe and this is "ether" also called "sky." Einstein finally moved positively beyond this notion of a stable grounding of movement, but he didn't shift away from movement. Rather, special relativity is all about the appearance of particles moving relative to one another as they approach the speed of light. The focus shifted from movement in retrograde or backfitted terms to movement itself, movement in its moving.

Notably, the notions of relativity, quantum mechanics, the Heisenberg Uncertainty Principle correlate with a post-modern world where there is no philosophical or religious ether, where there is no center, no uncontested foundation, no being presence, no god. Theologically this worldview correlates with the “Death of God” movement that was initiated by statements made by Friedrich Nietzsche in his *Gay Science* (1882), roughly contemporary with Michelson-Morley, but developed as a pervasive theology in the 1960s. And, as I have discussed above, the metastability and nonlinearity distinctive of quantum mechanics is at the heart of coordination dynamics as it has developed in the last quarter century. These notions inform the core of this book, copresence that is movement, as fundamental to vitality. In all areas of concern we are coming to understand that the world is interdependent with those who live in the world, that we create the world in a very real sense by our living in it and perceiving and knowing it. The shape and character and nature of the world is inseparable from our biologically skilled active perception of it and our cumulative human story as well as our experiential neuronal ensemblings, the biological self-adjusting network that gives dynamics to story of each of our lives.

The first point to be established is that, despite the efforts and assumptions since Aristotle that “something” must exist throughout space as the touchstone base enabling the movement of planets and even light, modern physics has demonstrated that there isn’t anything there! Thus when we say we see the sky, there really isn’t any object at all there we could possibly see. The sky is a virtual, a construct, a product of philosophers and physicists as a hypothetic construct necessary to support their understanding of the universe. The sky as firmament is the construct of religious folks to account for the stable location and residence of a creator or creators who, in their heavenly ethereal realm set the universe into movement grounded on the eternal and stable place. What is so fun to understand at this point is that the “sky” that we see, is a character in a very long story that has as its most basic concern the nature of movement (also touch) and how it can occur in the cosmos. So to address our challenge at this preliminary point, it surely is clear that with no thing to be seen in some objective way existing independent of human perception, the sky is humanly constructed and we seers must learn to “see” it. Thus seeing the sky is a human creative act that brings the sky into existence as we engage in the act of learning through experience to see it. What we see as “sky” is a profile of ourselves as in a mirror. This profile is a story long in the making, yet etched in our flesh. The seeing of the sky is to gaze at our long history of inquiry about movement and touch.

This discussion of seeing the sky can’t be all, though I like it so far. Now I want to consider why we “see” the sky as blue in color, indeed, we are so sure of the objective nature of this color as blue that we name a color after it, “sky blue.” If it is a color then doesn’t that assure us that the sky offers us an objective experience? Surely this experience of seeing (and how can our experience be questioned?) has nothing to do with touch and movement. The density of the atmosphere absorbs wavelengths of light unevenly. It absorbs most wavelengths more fully than those that are in the blue area of the spectrum. Where the atmosphere is thickest, which relative to a person standing on the earth’s surface, is nearest the horizon, it absorbs more of the blue wavelengths so the appearance is lighter in color. Thus it depends on the time of day, the place of the sun relative to the observer on earth, the moisture and other particles in the atmosphere (like pollution, which often produces the effect of “red” and “gold” and “yellow”) that may reflect and absorb light, and

on and on as to what wavelengths of light reach the eyes of the observer affects the color we see. Red sunsets, deep purple dusks, white hot summer skies, and black of night are all ways that we have come to describe the experiential effects of light waves on our retinæ based on where we are relative to the refracting and light absorbing atmosphere. There is no object, it is a virtual, something that comes into being only because of our act of seeing. The color that the sky appears, like the existence of the rainbow, is always relational and always subject to nonlinearity.

Now we don't ordinarily say "I see blue" despite this seeming in some sense to be the most accurate thing we might say, for isn't that what is happening? The blue region of the spectrum impacts our eyes, or so this modern explanation posits, so why don't we say, "I see blue?" I suppose another interesting question would be why we don't say, "I see light that has the color blue?" These are fascinating questions related to our concern with vision.

We don't see light itself. We don't see the waves and/or particles that comprise light. We see by means of light and the effects of light on the retinæ. Were we able to see light itself (but then how would we see it since we'd need light to do so?) wouldn't space be filled with light rather than being dark? The sun, as do all stars, emits light in all directions all the time. It fills the space in every direction; that is why we can see the sun from any place in the galaxy. But we don't see this sunlight itself as it is moving through all space. We see it only in the capacity of our eyes to establish a relationship, by means of light, with objects that emit or reflect light. We can't "see" light itself, but rather see by means of light. So what are we seeing when we see blue in the sky? We see the refractions of light created by the particles that comprise our atmosphere. In a very real sense it is the product of the physical encounter (contact) of moving light waves on atmospheric matter resulting in the scattering and refracting and filtering of these waves before they reach our eyes. Again what we are seeing as a blue sky is the effect of an orgy of atmospheric touching (encounter, affect) and moving. And isn't it fun that the more touching involved (the thicker the atmosphere) the more red the results. But why are we so confident that the sky is blue in color. Major surprises here; be patient.

Blue. Back to that seeming most obvious of all observations, the sky is blue in color. Let's start with William Gladstone, a British Prime Minister in the mid-1800s who had an obsession for Homer. Gladstone noticed an odd imbalance in Homer's use of color terms. Conducting an exhaustive study of every color reference in *The Odyssey* and *The Iliad* he found something startling: lots of references to black and white, a few to red and yellow, but no references at all to blue; not one! What could this mean? In the late nineteenth century Lazarus Geiger, German Jewish philosopher and philologist, curious about Gladstone's findings, decided to extensively review the incidence of color terms in ancient literatures around the world, that is, those roughly contemporary with Homer. Surprisingly he found no references at all to color terms correlating with blue among them, leading him to conclude that across all cultures, words for colors appear historically in stages. And blue seems always to come last.²⁷⁵ In evidence Geiger offered this example

Comment [SG61]: this whole section needs to be researched further.

²⁷⁵ See http://en.wikipedia.org/wiki/Lazarus_Geiger & radio lab <http://www.radiolab.org/story/211213-sky-isnt-blue/>.

from the Hindu *Vedas*: "These hymns, of more than ten thousand lines, are brimming with descriptions of the heavens. Scarcely any subject is evoked more frequently. The sun and reddening dawn's play of color, day and night, cloud and lightning, the air and ether, all these are unfolded before us, again and again... but there is one thing no one would ever learn from these ancient songs... and that is that the sky is blue." Blue objects are relatively rare in ancient cultures and Victoria Findlay's studies of color²⁷⁶ demonstrate how rare are blue pigments. It appears that color perception is linked with color terms and these color terms correlate with the capacity to create pigments. Wow, we're back to the hands-on moving/touching experience as fundamental to establishing the basis for the skilled action of perception. The relative rarity of blue objects [find out about presence of blue eyes] in nature and the correlate difficulty to make blue pigments²⁷⁷ correspond with the relative lateness of the appearance of terms for the color blue. Geiger's research suggested this conclusion, but it was forgotten until established more convincingly by the rigorous research on color terms by Brent Berlin and Paul Kay in 1969.²⁷⁸ This observation regarding blue raises the important question, if there are no color terms that designate blue or blue pigments, do people see blue as a color without a name or do they not see the color at all?

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Among the more interesting and convincing studies that help us come to terms with this question are those done by neuroscientist, Jules Davidoff. He studied color distinction among the Himba people in South Africa whose language has no color term corresponding with blue. Shown different color swatches including blue, these folks did not differentiate the blue colored patches from others. Given an array of green patches with one blue one among them, the Himba appear genuinely confused that there was one among the color patches that differed from the others. In contrast, given a group of green patches with one ????, the Himba can quickly pick out the different one, whereas, try as I might, I can't see any difference among them at all. It is as though without a term to designate a color, we do not "see" a color.²⁷⁹ [issue to follow is that we easily see colors for which we have no names ... how does this work in this situation?]

Comment [SG64]: read the sources on this and enrich this example here

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Another fascinating, yet incidental, example is when linguist Guy Deutscher, whose 2011 book *Through the Language Glass: Why the World Looks Different in Other Languages* traces the relationship between perceiving color and language, performed an experiment on his infant daughter while she was learning her color terms. He taught her all her colors and frequently quizzed her on the color of various objects. However, he made sure that no one ever indicated to her that the sky is blue. In time, after he was quite confident she was accomplished in color terms and the accurate identification of color terms to the corresponding color of objects including blue, he took her out on a clear day and pointed up asking her to name the color. He reported that at first she seemed confused and simply

²⁷⁶ Finlay, Color

²⁷⁷ Interestingly Christopher Moore's novel *Sacre Blue* spins its own story of the power of blue pigment.

²⁷⁸ Berlin and Kay ????

²⁷⁹ See <http://www.boreme.com/posting.php?id=30670> and http://www.essex.ac.uk/psychology/departement/people/Roberson_files/ProgressInColour.pdf (these don't seem to be there now)

gave no answer. Repeating this again and again on succeeding occasions he reports that it was a couple of months before she offered an answer and then she said, “white.” The blueness of the sky then seems to be linked to one’s experiential neuronal ensemblings that incorporate historical and cultural experience and practice prominently, in these cases, the correlation of experience with language. It is essential that what we consider as so objectively real—the blue color of sky and the sky as object—are, in part at least, the products of the accumulation of our experience of perceiving and knowing, shaped by both our biology and also by our cultural, historical, and personal environment. Further, that these are invariably based on movement and touching.

It is clear that this little exercise of considering “seeing the blue sky” could be broadly expanded, but to conclude, the point is that the question of whether or not moving and touching are significant in our being able to “see” the “sky,” it should be clear that from the perspectives of physics, color optics, linguistics/etymology, religion, cultural and religious history, movement and touching are the very core of enabling us to experience seeing the sky and seeing the sky as blue in color. Perhaps even more amazing and fascinating is that “seeing the sky” occurs at the very core of the most profound and fundamental and determining concerns of the history of philosophy, religion, and physics.

Presence

Certain things are frequently selected as the object of examination and exemplification. Whenever we consider the emptiness of atoms—you know that sense that at the atomic level of physical reality there is mostly space—we use a table and dramatically hammering away on its surface as we proclaim that it is “really” mostly empty space. In his 2012 *Varieties of Presence*²⁸⁰ Alva Noë tends to use tomatoes and coins and a picture of Hillary Clinton to illustrate the important aspect of presence in his discussion of perception. I appreciate this technique of argumentation and clarification because we are all fairly familiar with tomatoes and coins and Hillary so we can be convinced because the argument is confirmed by our quotidian experience. Or not! as tends to be my response throughout much of Noë’s discussion. I’ll engage Noë’s examples of tomatoes and coins and pictures of Hillary as a way of developing my notion of experiential neuronal ensemblings in conversation with Noë’s discussion of presence.

Only Academic Tomatoes have Backs

I grew up in a farm community in southeastern Kansas where all my relatives were not only farmers but also serious gardeners. I well remember as a high school youth trying to keep up with my tiny ninety-year-old grandmother working in her acre-sized garden. Tomatoes were a staple and for weeks in the summer we ate tomatoes fresh from the garden at every meal. My mom and grandma canned tomatoes and tomato juice so that we could enjoy the bounty throughout the winter months. After leaving home tomatoes pretty much left my life in any significant way. I suppose waxy red things labeled “tomato” occasionally appeared in my salads from time to time or as tasteless slices on hamburgers. Then some years ago I rediscovered tomatoes, especially as I discovered both farmers’ markets and caprese—sliced tomatoes with fresh basil and fresh mozzarella, olive oil, and

Comment [SG67]: Develop more what is meant by “presence” and perhaps anticipate or foreshadow the discussion of “fat present” When we begin to understand that perceiving and knowing are much more complicated than the direct objective recording of data representing the objective given world organized by language assisted conceptual ideas, then the issue of “varieties of presence” is raised. How is it that we experience as “present” the world of our perceiving and knowing. Presence is the somewhat more direct and less philosophical sounding term for what we usually engage by the term “consciousness.”

²⁸⁰ Also Alva Noë, “Colors Enacted,” in *Action in Perception* (2004).

balsamic—and I’ve been obsessed with the amazing qualities of “real” tomatoes since. I have been known to drive an hour to be present at the opening of a farmers’ market to be assured of getting first choice of home grown or heirloom tomatoes without even asking the price. I don’t even care that when I was a youth at home we had so many tomatoes we couldn’t even give them away.

I tell this small tomato story to suggest that I have rich and elaborate experience associated with “tomato.” I suspect that most do. My reading of Noë’s discussion of seeing the “backs” of tomatoes served up the raw sensation that engaged the rich cumulative experiential components that precipitated a visceral response followed by cascading reactions, most interestingly emotionally tinged; there can be nothing merely academic about tomatoes. That’s how I think it always works.

In preparation for considering his perspective I want to describe a quotidian process of “picking tomatoes.” This might well apply to picking tomatoes from a vine, but I’ll be even more banal and focus on selecting individual tomatoes in a market. It is an emotional experience because it is filled with the anticipation of the indescribable delight of eating these tomatoes. As I cast my eyes about the piles of distinct varieties of tomatoes, based in part on the shade of red or green or yellow or gold and the size and shape, I already have a sense of many characteristics of most of these tomatoes: density, inner structure, prominence of seeds, texture of skin, and distinctive flavor (or its absence). I then begin the process of final selection. I pick up a few to feel the heft and the texture of the skins. Based on my experience I hardly even see those perfect little red balls with consistent color that I know, should I actually pick one up, would feel waxy and hard (not firm) indicating a thick skin and I know that while these might add decoration they would add no flavor to food. From the feel, the heft, the smell, the squeeze, these waxy red orbs really should be labeled something else because their taste, if one can consider it taste at all, is not remotely related to that of “real tomatoes.”

Anticipating Noë, my visual experience, while perhaps serving as a trigger of my tomato ensemblings, is perhaps the least important in my experience of picking tomatoes. Foremost in importance are the heft, the squeeze, the smell, the anticipated taste and all of these are based on the accumulation of experience gained from years of growing, eating, selecting, handling tomatoes. I have to handle the tomatoes to select them; it is part of the aesthetic experience of appreciating them and valuing them. Yet, with a cursory look I can easily and quickly limit those I wish to heft. I not only pick them up and give them a light squeeze; I give them a bit of a heft to evaluate the density. And, of course, I turn them around to examine the whole tomato to assure there are no blemishes or bruises. Sometimes even a split in the skin indicates the juiciness and ripeness I’m eager to find and does not disqualify my choice.

What I want to suggest is that for anyone with much accumulated experience of tomatoes, vision is but a minor dimension involved in picking tomatoes; dare I say of the whole range of values associated with tomatoes. Indeed, were I to contemplate picking tomatoes blindfolded, I think I could do an excellent job without ever seeing the available tomatoes. Noë’s discussion of tomatoes is wholly limited to vision; indeed, his entire discussion of presence is limited primarily to vision even though he presents perception as a skilled

activity and does engage the possibilities of touch as exemplary.²⁸¹ Considering Noë's position will offer me the opportunity to not only briefly consider his understanding, but also to indicate how my proposed notion of experiential neuronal ensemblings has, for me anyway, notable advantages.

Noë takes up this tomato issue under the topic "presence as absence," that is, when an "object shows up for visual consciousness precisely as unseen."²⁸² He writes, "you look at a tomato. You have a sense of its presence as a whole, even though the back of the tomato (for example) is hidden from view. You don't merely *think* that the tomato has a back, or *judge* or *infer* that it is there. You have a sense, a visual sense, of its presence."²⁸³ The study of perception has long concerned itself with this sort of issue, the issues of presence and access. Although he consistently limits himself largely to vision Noë summarizes presence in absence this way: "features of the world . . . fall within the scope of your perceptual awareness despite the fact that they are, in a straight-forward way, out of view, or concealed, or hidden, or absent. They are present in experience—they are *there*—despite the fact that they are absent in the sense of *out of view*. They are present precisely as absent."²⁸⁴

Of interest to me are the many assumptions that receive no attention in even raising the issue of presence. First of all is "tomato." Noë does not discuss any absent factors in the assumption that the object seen is a tomato. Yet, we all know that were we in a world where we had raw sensory data of "tomato" for the very first time with no related accumulation of experience, we might "see" something, but it wouldn't be identified as a tomato. "Tomato" includes, as I indicated above, objects of a great many shapes, colors, densities, textures, sizes as well as a great many other highly nuanced features. Consider for example how we easily distinguish between two small spherical objects of the same size, both red in color—one a cherry tomato, the other a cherry. The point I'm making here is that "tomato" is not simply an objective purely visual distinction based on visual sensory information that correlates directly with the distinctive criteria for a specific object identity. Rather, tomato is a skilled gestural act of encounter based on the accumulation of experience; lots of experience. An interesting example is that if we identify the object of our perception at the next level higher category of objects, we would likely identify it as a "vegetable" whereas technically it is a "fruit." This mistake in categorization is based on the accumulated experience of the other edibles with which tomatoes are most commonly associated. Think of V-8 juice, as in 8 vegetables, in which tomatoes are not only present but give the juice its distinctive appearance. Tomatoes grow in a *vegetable* garden. What we perceive when we see an object we call "tomato" is a representation of a complex category with extensive potential for variation, including some commonly held botanical misinformation. The visual stimulation of the object category "tomato" is entwined with many other perceptual experiences of multimodal character—smell, taste, touch, heft, weight, structure, color, and so on including chopped and diced and pureed and sliced and quartered and paste and salad and spaghetti and grandma's garden. All of these are

²⁸¹ Noë, *Varieties of Presence*, 72

²⁸² Noë, *Varieties of Presence*, 16.

²⁸³ Noë, *Varieties of Presence*, 15-16.

²⁸⁴ Noë, *Varieties of Presence*, ?

ensemblings associated with “tomato;” we can’t simply have an objective “tomato.” We can’t really begin, as Noë does, with just “tomato;” presence is always inclusive of accumulated experience, that is, the past experiences accumulated to be available in any present encounter.

A related concern is the classic issue of “representation.” Noë, as most current students of perception, reject that when we “see” a tomato we have a mirror projection of the sensory data forming a picture or representation of this object somewhere in our heads. Noë persistently critiques representationalism and rightly so, yet I think that his solution—an actionism, a “knowing” how to move relative to an object to “see” the absent parts results in “seeing” the absent parts—is inadequately developed in terms of where this “knowing” resides and how it works in some specific biological terms. He identifies this “actionism” as a skill, and a movement-based skill, which I find inspiring, yet I believe he remains unclear about where in the animate organism this skill resides and persists and develops. Part of this shortcoming is the collapsing of experience into the present engagement of perception and not allowing perception, as I have argued, to accumulate as experience.²⁸⁵ This accumulation must be neuronal to a large extent; where else could it occur? This means not only in the brain, but also in the patternings of proprioceptors, tonus, and throughout the body. This accumulation of experience is not mirror or picture representation, yet it must amount to the constant revision of ensemblings (neuronal connections and patternings) and discrete data of experience. While I do not believe that it is yet adequately known how this information is stored and precisely how its connections are retained as patterns, surely it has to do with synaptic criteria and the coordination dynamics of a vastly complex reentrant degenerate self-adjusting network system.

Secondly, Noë uses the term “back” to refer to a tomato without any discussion; indeed, this is the part of the tomato most essential to his entire discussion. He assumes that “back” of tomato makes sense and needs no clarification or justification. What interests me is that in my considerable tomato experience (likely about the same as everyone else’s) I believe it is highly unusual to refer to the “back” of a tomato. We don’t refer to the “back” of a ball or the “back” of a globe or the back of an ear of corn or the back of a pea. We refer to the backs of things that have a clear distinction that provides them a privileged orientation such as a “face” or “front.” Heads have backs, bodies have backs, chairs have backs, homes have backs, and books have backs. Even for the moon, a sphere that has a “face,” we do not refer to the back of the moon so much as we do the “other side” of the moon although because of the moon’s “face” it wouldn’t be so unusual to say “back side” of the moon. My guess is that in the repertoire of ensemblings related to spheres, the spherical sense of the moon (not experienced as readily as a ball) trumps the fact that we always see the same

²⁸⁵ Although Noë does occasionally see perception synchronically as in “Perceiving is exploring the world. It is a temporally extended activity. What we call seeing the apple just is an episode of exploration. And so we can say that we enact the perceptual world by skillful exploration. In this way of thinking about perceptual experience, perceiving is not a way of representing, it is a way of gathering or assembling content.” (59). Yet, Noë does not explain how skill is acquired, where it resides neurobiologically, and how it is developed. It seems to me that to do so would require a discussion of representation, in the terms he raises, how gathering and assembling content is not representation in some sense.

side of the moon. An object might move “behind” the moon; here the experiential ensemblings of occlusion become relevant.

What I propose is that the whole notion of “back” related to tomato is the result of ensemblings (in Noë’s and his cohort’s constructs) that include interweaving oriented objects (things with backs) with an artificially visual criteria (seeing an object from a single position) with the quotidian experience of perception as multimodal and holistic in order to ask a kind of question that is largely the product of such artificial academic ensemblings. What I’m saying is that to identify an object as “tomato” is already the product of experiential neuronal ensemblings and it includes the ensemblings of experiences comprised of a great many aspects of a category of objects as well as the infinite potential of context/environment that are connected with these perceptual experiences. I am also saying that “back” is an introduced relationality that is artificial to tomatoes. It is the connection from the accumulated experience of other objects ensembled along with the experiences of “tomato.” The concatenated terms “tomato” and “back” create a set of concerns that is not typically a part of either term and the resulting artificial (in the sense of academically constructed) ensemblings tend to also limit the mode of concern to vision, which is also not typical of either term. Thus, at least so far as backs of tomatoes are concerned, this ensemblings is constructed specifically to address the issue of philosophy more than perception—only academic tomatoes have backs—although that the back of tomato can even be imagined is testimony to the plasticity of experiential neuronal ensemblings.

I raise these two issues for important reasons. I argue that the discussion of perception that is raised by considering the back of a tomato is already closed, largely predetermined, by simply assuming “tomato” and “back” without any discussion of the processes of perception necessary to distinguish these objects/relations. These assumptions are both, I argue, ensemblings that develop necessarily only across the entire perceptual biography of the perceiver. To attempt to approach an account of perception having already assumed this history is naïve at best and the problems raised are likely artificial, constructed in order to support a position already assumed. This is a profile of my Humpty Principle.

Now of course there is the issue of the difference between the objective raw sensory data and the sense of the world as perceived, yet the entire modern discourse on perception assures us that there is not a time early enough in life for us to find a one-to-one relationship between what is perceived and raw sensory data objectively registered. Perception is always the skilled interrelational moving touching process that is constantly changing as perceptual experience accumulates. Perception is the synesthetic construction of the world through experiential neuronal ensemblings, never simply the representation of a world objectively given. So we might well say that the raw sensation at our eyes register but a profile of a complex many-faceted object (if we can even distinguish it objectively which is doubtful), but we “see” and more broadly we perceive (also implying knowing and recognizing) “tomato” which is the invocation of a massive accumulation of experience in all sorts of potential ensemblings all somehow interconnected, entwined, as “tomato.” Another way of saying this is that our recognition of an object as “tomato” has already dealt with visual profiles as well as dozens of other perceptual aspects of the object.

Noë offers actionism as the solution to the problem he poses. “The fact that we visually experience what is occluded shows that what is visible is not what projects to a point. I propose, instead, that we think of what is visible as what is *available from a place*. Perceptual presence is availability.”²⁸⁶ Interestingly Noë invokes movement here as key to this idea of availability. Availability means to him, not simply what is represented in the mind, but rather what can be available based on movement. Noë’s notion of availability is identified with a “mastery of the ways in which my movements produce sensory change.”²⁸⁷ So one can move one’s head slightly or walk around a tomato and gain access to its “back.” Also, of course, the object may move relative to the stable position of the observer to acquire this change that allows perception. Expanding this notion, Noë writes, “perceptual consciousness is a special *style* of access to the world. But *access* is not something bare, brute or found. The ground of access is our possession of knowledge, understanding, and skills. Without understanding, there is no access and so no perception.” And this understanding seemingly accumulates as skill, as a “sensorimotor understanding.”²⁸⁸ Yet, what precisely is a “sensorimotor understanding”?

Noë’s account converges in important ways with my account of experiential neuronal ensemblings, yet the differences are significant. His notion “sensorimotor understanding” implies something quite different than what I want to suggest by the accumulation of experience. I don’t think it is appropriate to refer to the accumulation of experience related to “tomato” as “understanding.” That seems to indicate something (the understanding) already coherent, when what I want to indicate is the mass of memory, images, relationalities, variations, concepts, and so forth (that exist as criteria for synaptic and coordination dynamics) are the ingredients out of which coherence can be momentarily ensembled only to quickly pass back into plastic ingredients. Further, Noë does not anywhere in his book, so far as I have been able to locate, give an account of how such an “understanding” is achieved. Nor does he discuss the development of such an understanding or how an understanding of tomato might interconnect with an understanding of other objects/relations like “back” or “salad.” Clearly it would seem to me to depend on “experience” yet he doesn’t indicate how that is accomplished, especially biologically. This absence, I believe, gets Noë into another complex issue that has no satisfying solution. All perception is then but recognition. He writes that without “understanding” there is no access and therefore no perception. I agree, yet, how does one gain an understanding without access that can provide the basis for understanding? This isn’t adequately addressed. I have noticed that many discussions of perception confine themselves to examples of an instance of perception that does not include placing it in the long history of the accumulating experience of perceiving. While Noë understands perception as skill, he doesn’t include an adequate discussion of how that skill is acquired

²⁸⁶ Noë, *Varieties of Presence*, 19. See also numerous other statements of actionism such as “there is no perceptual experience of an object that is not dependent on the exercise, by the perceiver, of a special kind of knowledge. ... that is “the sensorimotor understanding” [check quote] 65. But Noë does not describe how this knowledge is acquired or stored or contributed to the skills of actionism.

²⁸⁷ Noë, *Varieties of Presence*, 20.

²⁸⁸ Noë, *Varieties of Presence*, 20.

and developed and refined over time, although he occasionally acknowledges that it is a temporal process.

Another face of this issue is that of novelty. Noë writes, “To perceive something, you must understand it, and to understand it you must, in a way, already know it, you must have already made its acquaintance.” Noë then concludes, “there are no novel experiences. The conditions of novelty are, in effect, the conditions of invisibility.”²⁸⁹ Novelty is a fascinating issue; one I believe is of enormous importance. Novelty has to be not only possible but also absolutely routine for us to have any sense of vitality and surely the very ideas of perception and knowing are vacuous without being able to account for novelty, for something new and original with every perceptual experience. We almost lose the distinction of perception if what is perceived isn’t, in some sense, always novel. As I have frequently discussed in the terms of copresence, there is a sense of two things being copresent that require distinction. Copresence, I argue, holds in this case as well. Perception and knowing are recognition in many respects, yet it is the copresence of recognition (same) with novelty (difference) that creates the gap for plasticity, for change, for movement, for development, for enhancement, for freedom, for vitality, for enhancing skill, for adding something in the accumulation of experience. We perceive the world based on the accumulation of our experience perceiving the world, but every moment of perceiving the world changes the character of that accumulation of experience and re-ensembles it with infinite potential plasticity. The metastability and nonlinearity that characterize the coordination dynamics of our biology assure that the novel is both surprisingly new as well as common. The dynamics of the moving of the animate organism in relation to an independent environment always introduces the surprising and the novel into the familiar and the known. Isn’t this copresence essential to all perception and knowing? It is that our experiential neuronal ensemblings are always open-ended and reentrant that novel variables are constantly being introduced, producing the oscillatory vibratory resounding vitality we call perceiving knowing living.

Why are Coins Round?

In large measure the discussion of coins is a replication of the discussion of tomatoes. Noë provides a discussion of coins as a vehicle for presenting and critiquing a variety of views of perception—sense-datum and direct realist, in particular—that have often been articulated in terms of this coin example. Coins, and also plates, are often used as examples with attention being drawn to the aspect that, seen from an angle (again assuming obliquely with the objects on a table for example), the raw sensory data would present an elliptical shape rather than a round one, yet most “see” or at least indicate that what they see a “round” object. The issue is why we say and perhaps even experience seeing “round” when objectively the raw sensory data present to the eye “oval.” As should be totally obvious by now, I’m not here interested in solving this issue or even reviewing the various arguments. Rather, what I’m interested in is revealing that the Humpty Principle is powerfully at work as the issue is set up and then to offer alternatives by which we can at least have a question that isn’t answered in its asking. The issues are discussed based on the example of a “coin” or a “plate” without ever asking how we identify “coin” or “plate” as

²⁸⁹ Noë, *Varieties of Presence*, 20.

the object of our attention and what implications there are by this unquestioned assumption. What factors are brought to these discussions that largely determine the outcome but are never even considered because the assumptions of the setup do not raise the simplest concerns? It is my interest to ask the questions about the assumptions and in so doing to show the potential of proposing experiential neuronal ensemblings as a way of accounting for the complexities of perceiving and knowing.

To begin I just ask, “Why do we believe that coins are round?” I’ll let coins represent plates, yet I point out that in doing so I’m ensembling without explanation (that I could give) of experiential profiles of both categories of objects (a remarkably complex process that we can do without effort and that we do constantly). This is a question not asked, to my knowledge (at least in Noë); indeed, the question seems a bit ridiculous doesn’t it? Noë and others sometimes consider the circular shape of a coin to be “normative” or “optimal,” yet they do not discuss how such valuations can be justified; I’d consider these valuations as inherent to accumulating experience of perception. Noë holds that, if a coin is lying on a table a few feet from us and we are asked what is the geometric shape of the coin, we will invariably indicate that it is “round” and we will “see” it as round. When we reflect on the actual shape that meets our eye, we know that it is elliptical, as we also know that we see it as round.

By way of asking why we consider it to be round at all and what it is that we are exactly referring to when we say that a coin is round in shape, I want to engage in a little thought experiment. Let’s imagine that we have never encountered anything called a “coin” before; it is an object completely unfamiliar to our experience. Let’s imagine that we could construct something like a Ganzfeld in which to first encounter a “coin-shaped” object that did not have any markings on either side. The Ganzfeld-like context would provide no shadows or background that would serve as a gradient by which to judge size or position or relationship of this object to anything. Further let us say that the object is black on both sides and the background is white. Now I don’t think it would be terribly difficult to go into a lab and do some tests, but let me indicate perceptual scenarios.

Group A is shown the object in a fixed position tilted (by the experimenter but unknown to the observer) at a 30 to 45 degree angle of the incidence to the eye of the observer. The subjects are shown the object and told, “this is a coin;” remember that none of them has any idea what a coin is. For Group B the angle of incidence is 90 degrees to the eye of the observer so that only the “edge of the coin” (which, of course, makes sense only to those who have experienced coins as coins) is visible from the location of the observer. Again the subjects while shown the object are told, “this is a coin.” For Group C the angle of incidence is zero, that is, the flat surface is perpendicular to the observer’s eye. And Group D, the coin is actually slowly rotating on a fixed axis.

This thought experiment is presented to suggest that “experience,” as in experiential neuronal ensemblings, determines one’s understanding of the “shape of a coin.” Now, I believe that Group A would say that the shape of a coin is elliptical (oval); B would say its shape is a thin rectangle or perhaps a fat line; C would say a circle (likely not “round”); D would say it was a shifting shape that was most of the time an ellipse (expanding and contracting) with half the time tending toward a thin rectangle or fat line and half the time tending toward a circle.

A couple other supposed observations. If the subject in all these is not told that there is even an object there, yet she is asked to describe what is seen, I think it fairly likely she would indicate that what is seen is a hole in the field or simply a shape rather than an object. Each of these observations would ensemble various accumulated experiential blocks with the sensory data. Further, for the rotating object, it would not make any difference to the observer which direction the object was rotated on its axis; to many in this group it would appear to be a changing shape rather than a rotating object (again this would likely depend on their prior experience ... my whole point here).

Of course the point here, as with all Ganzfeld-type procedures, is to consider what is learned when we attempt to strip an object of perception of any direct relationship to a context or any connection with accumulated experience (Wittgenstein's efforts to "unsee"), so that such experience can be intentionally introduced in a controlled way. I'd argue that even in the most controlled procedures the subjects would not be coming to this visual sensation without drawing on prior accumulated experiences and lots of them. Prior experiences that I hold would be necessary for the responses that I have indicated would be the fundamental and simple experiences of dark and light, basic shapes such as rectangle ellipse and circle (and to "know" that circle is equal to "round"), and notions of expansion and contraction of shapes. All of these are actually fairly sophisticated concepts that take considerable accumulated experience to develop. Perception is always an experiential neuronal ensemblings.

Now, back to my question: "Why do we consider coins to be round?" I believe it is clear, based on the Ganzfeld-type example just presented, that the great majority of actual (in the sense of raw sensory data presented as objectively as possible to the eye) visual registering of a coin-like object is when it occludes the shape of an ellipse and that we experience it only rarely among all moments of encounter as either circular or rectangular and these approximately the same brief amount. Given this information, why would we so confidently identify a coin as round when this is only one (and a rare one) visual profile presented to our eyes and it is, compared with all the other possible profiles, exceedingly rare? It is also interesting that we typically would identify the shape of a coin or a plate as round rather than a circle, although we might select either as objects to provide a template when we want to draw a circle. And another fascinating matter is when a long thin rectangle would be considered a "line" or a "thick line." What privileges a 90-degree incidence of the surface to the observer's eye? If one were to ask the subject experiencing/seeing the rotating coin-like object in the Ganzfeld-type context what shape it is, you would likely have to give them some way to begin to understand it as an object rather than a hole or a shape. And, of course, such perceiving and knowing are dependent on prior experience accumulated related to a whole range of things like shapes and objects; recall how extensive is the process of creating these perceiving/knowing skills in toddlers. But once these aspects of experience have become a part of the experiential ensemblings, then surely the observer would say, "It is elliptic expanding and contracting to a circle and a line (or thin rectangle)." If a subject were asked to select just one shape that had to characterize this object, surely it would be oval rather than round or rectangular because both round and rectangle are relatively rare.

This little exercise clearly demonstrates I believe that both our unquestioned sense that coins are round and that we “see” a coin presented to us at an oblique angle as “round” are the result of something beyond the physical shape and visible characteristics of a coin-like object. What is seen is the result of the ensemblings that include clues that identify the raw sensory data as a particular kind of object and that object as a “coin” and that precipitating ensemblings that give focus to shape related, via degeneracy, to coin and so on.

We can make general (if perhaps rather inexact) distinctions among 1) the raw rather objective stimuli that engage sensory receptors, that is, pure sensations, 2) the accumulated experiential profiles loosely associated with everything we know and have perceived, 3) the comparative, negotiative, creative, projective processes that take place involving both the raw stimuli and the experiential profiles, that is, the ensemblings or resources for ensemblings, 4) the perception as reported as registered or aware, and 5) the continuing refinement and development of the accumulating experiential neuronal groupings, a diachronic assemblage. Touching and movement are primary/fundamental. The distinction of the traditional five senses seems secondary to the amodality or synesthetics of perception when understood as a skilled process involving experiential neuronal ensemblings. That is, when we say, in the case of the coin, that we see the coin as round, we are actually saying that the raw visual stimuli are interconnecting with a neuronal ensemblings that has been established and developed over time by the repeated “handling” (a good word in that it implies touch and movement of coins with the hands) of coins in a cultural historical context. What we see is due as much to our hands handling coins as to our eyes seeing them. As has often been shown, it is almost impossible for us to perceive like a baby, that is, a perception that isn’t the result of skilled ensemblings. It is doubtful that we simply can perceive in a way limited strictly to raw sensory data at all; at best we construct the idea of raw perception as a retrograde process, an unseeing in our visually dominant environment.

So why do we see coins as round? I believe that we do so because we have handled coins in a cultural context that amounts to the development of experiential ensemblings identified with “coin.” As we learn through experience what a coin is, we handle it, turn it over and examine it. We can see and feel the faces and images embossed on the surfaces of the coin. These often include dates and the indicated monetary value of the coin. We often focus on the difference between “heads” and “tails” recognizing that one side is different from the other and that these are often important distinctions, as in “flipping a coin” as a method of engaging mathematical chance. We learn that a coin with two “heads” is bogus. In observing a coin, we observe through experience that a 90-degree incidence to the eye of the observer is the position in which the images embossed are most fully observable with the details all of equal perspective. This positioning then becomes slightly privileged. At one time or another in our youth many of us start coin collections, filling those folders with places for coins as we expand our collection. These folders privilege the “heads” side and they hold each coin in a location where the ninety-degree incidence is privileged. These folders are equipped with coin-holding “circles” confirming the “roundness” of coins. We may visit a mint where coins are made and see that they are stamped from flat sheets of metal. Finally, from this privileged vantage angle the coin is round in shape. In our handling of coins, we understand that coins are coins no matter from what angle we see

them, but we learn through experience that they have a preferred angle of view and from this angle they are round.

What I'm suggesting here is that the roundness of coins is a factor of experiential ensemblings keyed to "coinness" constructed from all of the incidents of our experience with coins. Certainly that experience is constantly changing, is never fixed (as it would be in "an understanding"), is open to newness or novelty, and varies with age, culture, history, language, and many other factors. "Coin," a broad fuzzy amorphous momentary ensemblings, is comprised of many experiential gropings available for endless varieties of ensemblings as needed by both the streams of sensation and the processes of reflection. Furthermore, our every experience of interacting with "coins" contributes both to the memory of incidents of coin handlings and to the composite of "coin" we hold. For example, when we encounter "coins" that have holes in them or that have many flat edges, these handlings contribute both to specific incidents (allowing us to identify specific coins in terms of these characteristics) and to the fuzziness of our composite understanding of coins. We'll likely still consider a coin with many flat edges as "round" in some sense, but only because it is a minor example among the larger set.

I'd like to quickly consider another example that may be helpful, a button or better a buttonhole. In our handling of buttons (and interestingly children seem to love to play with both coins and buttons; although on reflection this is surely a betrayal of my age and generation) we have the same sense that buttons are round no matter at what angle we see them. I think this comes from the knowledge of buttons we gain in observing buttons sewn on clothing where we see them from an angle perpendicular to their flat surface. Yet, when we think of a buttonhole, we don't see a button-shaped hole at all, but a slot. Likely our generalized experiential ensemblings of a prototypical "hole" is round, yet the very functionality of a button is that it goes through a slot (corresponding with the shape of a button seen at an angle 90 degrees of incidence to the surface) where its shape is that of a very thin rectangle or a line. Clearly putting a round button through a round hole would not allow buttons to function as buttons are intended. There is a similar aspect of our experiential sensorimotor knowledge of a coin when we use coins in vending machines. Notably we experience the place or opening where we are to insert the coin as a "slot" not a rectangle or a line. We place coins in thin rectangular slots to pay for our items. The shape we see of a coin in the context of a vending machine is, I would argue, a thin rectangle rather than roundness. Our intention is on matching the denomination of the coin with the correct slot by the size of the rectangular shape of the coin, the diameter of the coin (when round is the standard) with the length of the slot. I don't know of any laboratory experiments done in this context, but I'd suspect that if you tested a bunch of hungry munchers standing in front of a vending machine, you might find that they would see the long rectangular shape of coins at least as prominently as they would see the coins as round. My guess is that they would identify coins by denomination correlate to length of edges, rather than shapes. And, of course, this example may be totally arcane in that most vending machines now require bills rather than coins. The obvious point is that the shape of the coin that we see is influenced by the use and context that is ensembled with the rest of our accumulated experiential resources for "coin."

In writing of coins I have been interestingly uncomfortable with the idea that coins remain objects of which our young still have considerable experience. Indeed, I never use coins myself and, in the rare unfortunate occasions when I wind up with coins, I don't really know what to do with those I have left over. Likely a decade from now this whole discussion, even expanded to money as actual objects, will seem dated, a historical curiosity; money as physical objects will have disappeared. What is the shape of bitcoin?

Picture of Hillary

Noë considers pictures of Hillary Clinton in his discussion of presence in pictures.²⁹⁰ He identifies his topic as "seeing pictures" and asks, "What do you see when you look at a picture?"²⁹¹ As typical of Noë's book, the mode is vision and the issue considered is representation. By focusing on pictures, Noë wants to assure that seeing is not representation as are pictures, "Seeing is not itself pictorial."²⁹² Noë understands seeing a picture of something is somehow a special case, "*a distinct style of seeing*. Indeed, it would not be entirely misleading to say that pictorial seeing is a distinct modality of perceptual consciousness."²⁹³ He explains this as a "double aspect" in that what you see is the subject in the picture, that is Hillary, because there she is right there; we're looking at *her*. We can even say simply, "There's Hillary!" But then Noë says that the other aspect is that we are seeing a picture, not Hillary in the flesh so to speak. A picture of Hillary then has a double aspect, Hillary herself (it is indeed her and not Bill or Chelsea), but it isn't Hillary in the flesh but a picture of her; in this sense you do not see her at all. Noë describes this mode or style of seeing as "pictorial presence," distinguished as showing up "precisely—obviously, palpably, manifestly—not present."²⁹⁴ She shows up precisely as absent.

Now there is a great deal that might be said about his example including the many ways that this perceptual experience has been explained and discussed by others. Again, surely it can easily be anticipated where I will begin and that is that the very issue begins with "picture of Hillary" that assumes that we already have experience with "picture" and "Hillary." My first response to all who discuss this issue is that the unquestioned premises already determine the discussion and the conclusion via the Humpty Principle. But at least this example may afford opportunity to discuss other aspects of experiential neuronal ensemblings.

Experiential neuronal ensemblings are commonly comprised of clusters of other ensemblings and/or linked chains or networks of ensemblings. In acts of perception these clusters are commonly blended²⁹⁵ and conjoined and compared and a great many relational connections are made, always fluid and always temporary. Such ensemblings processes furthermore always add to the accumulating experiences. So for example we each likely have an experiential sensorimotor profile of Hillary Clinton. These will vary among us based on who we are, the specific experience we have had with Hillary, our culture and age

²⁹⁰ Noë, *Varieties of Presence*, Chapter 5

²⁹¹ Noë, *Varieties of Presence*, 83.

²⁹² Noë, *Varieties of Presence*, 82.

²⁹³ Noë, *Varieties of Presence*, 83.

²⁹⁴ Noë, *Varieties of Presence*, 84.

²⁹⁵ See Facconier and Turner

and gender and political affiliation, and so on. Notice that this profile is multisensory. We likely have something of a vague image of her appearance so we all recognize pictures of her or recognize her should we encounter her in the flesh and we are also capable of the comparative negotiative task of identifying her in pictures that we have never seen before and even pictures of her at a wide range of ages. But we know that our knowledge of Hillary is not limited to simply recognize her physical appearance. Yet, when asked what constitutes this knowledge, we don't have anything like a visual image of these profiles or ensembles. They comprise a vague hazy cluster of a great many things; we are aware of these knowings more as a feeling or feeling markers than as something content specifiable. Contextualized variously we might allow different but conjoined or nested profiles to emerge: woman, politician, First Lady, Senator, Secretary of State, and on and on. But we know that no one of these is "she" while we'd all say that, in some sense, we know who she is. We would also quickly admit that we don't actually know "her." When we identify a particular profile of Hillary we nest or overlay our ensemblings of Hillary with other profiles such as woman or Secretary of State or "knowing at a distance." I suggest that all of this knowledge of Hillary is gained in ways that are ultimately grounded in movement/touching contact with the world and this holds even though most of us may never have actually seen Hillary in the flesh.

Now Alva Noë engages an extensive discussion of how we "see" Hillary and know it is Hillary in a "picture" and how that differs perceptually from seeing her "live" so to speak. This becomes a tricky philosophical and phenomenological problem since we know that the Hillary in the picture is not the actual Hillary, yet we say that it is. My suggested solution to this is that the answer is in the phrase "picture of Hillary." The phrase invokes at the outset the intersection of the accumulated experiences related to "picture" with subsets for "photograph," "painting," or even "word sketch" or "imagination" with the accumulated experiential ensemblings we hold for "Hillary" in all of their fuzzy richness. If we can't tell the difference between the picture of and the fleshy Hillary, we have a perceptual problem or a special condition like an impostor or *trompe l'oeil* painting, but even these, if recognized, contribute to the enrichment of one or more of our evolving experiential ensemblings.

Now let me circle back to "picture" for a brief comment. Whereas Noë wants to isolate pictorial presence as a separate and special style of perception, I can't understand it as at all special. After all among the earliest concepts that accumulate enormous experiential ensemblings is "picture." From very early in life, infants are shown "pictures" and when the objects in the pictures are identified they are identified as "pictures of." Evidence that the concept "picture" has nascent hold on infants is that they treat the cat differently from the picture of cat, and so on. They have gained the prosthetic function of picture, the "of" power of depiction by representation. I'd argue that pointing, counting, using fingers to represent or indicate, to draw, to abstract shapes from objects and so on are all of the same process. Such fundamental concepts/experience clusters or ensembles are acquired early in life and involve extensive moving/touching experience (the picture of the cat and the cat feel and act differently), yet they continue to develop and expand throughout life as experience endlessly accumulates. This is the ensemblings, fuzzily connected with the word "picture," that amount to a crucial and early concept or set of nested concepts. It is our ever-evolving and accumulating experience of pictures, which by age two is already

vastly complex and varied, that is blended with our ever-evolving and accumulating experience of Hillary (or anything else like cat) that affords us the skill to negotiate the raw sensations connected with “a picture of Hillary.”

In this example, perhaps what is most interesting to me is that “picture of” is a different kind of ensemblings than is “Hillary,” or so it might appear. At first “picture of” seems abstract and relational (there can be infinite pictures of) while “Hillary” seems concrete and objective (there is only one Hillary and she is finite). It might be tempting here to suggest relational concept as one category of ensemblings while objective reality or something like that as another. Yet, to push either “picture of” or “Hillary” even modestly is invariably in the direction of convergence and identity. “Picture of” is certainly gained and based on experiences of actual pictures and actual references. This ensemblings is remarkably physical in its grounding; way more so even than is “Hillary.” Further, when we think of Hillary, we understand it is one woman, but our experience of “her” is at a distance and highly abstract and while she is a finite and objective being on the one hand, there is no limit on how much experience we might accumulate related to “Hillary” even in the most banal sense of both of us, Hillary and me, being living beings inseparable from constantly unfolding experiences.

Bottom line, I don’t think it is defensible or advantageous to argue for a distinctive mode or style of perception for “presence in pictures.” Rather I’d hold that presence as absence is distinctive to our ensemblings of “picture” in the very same way that roundness (which is rarely the shape presented in raw sensory data) is to coin. Perception invariably involves playful skillful ensemblings of endlessly possible and plastic neuronal groupings. The comparisons, connections, groupings, novelties, and blendings comprise skillful encounter with the presence of the world, including our own thoughts, as we live.

Perceiving and Knowing

Write a chapter summary here.

Comment [SG68]: Yes and include summation on presence

8 Coherence

The feeling that things are right, that they fit; the release from that niggling feeling of something incomplete or out of place; the expiration of breath we feel with conclusions; the lift of feeling when inspired— all these feelings, although momentary and all too transient, are I think related to coherence. I believe that coherence is grounded ultimately in feeling or a quality of feeling. It is a quality of experience rather than a thing to be measured or calculated or reasoned. The etymology of the term is fascinating. Cohere derives from sixteenth century French *co-* “together” plus *haerere* “to stick,” which, of course, yields pretty directly our current sense of cohere as “to stick together.” Yet, *haerere* is from the Latin *haesitationem* (nominative *haesitatio*) “a hesitation, stammering,” figuratively “irresolution, uncertainty.” It seems to me that the power and interest of the word coherence rests not exclusively in its sense of “to stick or fit together” but in some residual copresence of this sticking together in the presence of hesitation, irresolution, and uncertainty as suggested by the deeper Latin root. It is in the persisting company of hesitancy and uncertainty that coherence finds its force. In this sense, coherence shares something with movement, for it is always in the persisting possibility of moving ceasing that moving has its energy and its distinction; moving is always a force against the inert. Coherence too is not some condition, logically describable; it is a force characterized by a certain kind of feeling and the feeling is not a simple one such as rest or even stability. Coherence is, in a sense, the unexpected and momentary feeling of “fit” in the midst of so much potential for its absence. Coherence is a momentary hedge against chaos; the potential for coherence drives hope and thus gives bearing to movement. Coherence is an aspect of Barbaras’s “desire.”

In the modern world we have become something of *meaning* junkies despite the postmodern efforts (likely convincing if we could only understand them) to reveal how foolish is meaning especially in any sense of *the* meaning. We tend to want to find the meaning in and behind things, everything. We want our lives and our worlds to have meaning. We ask about meaning; we quest after meaning; we write about meaning; we test for meaning. Meaning is often understood as requiring articulation and argumentation and support. Meaning is often confined to the singular, *the* meaning, for how can the acceptance of many possible values indicate anything other than meaningless relativism? Thus we argue over “the meaning” of things. Meaning is articulated in the absence of the adequacy of something in itself; that is why we must find the meaning “in” or “behind” or “of” things. This aspect of meaning is a bit disconcerting. Trying to keep the attention on the thing itself, I often make the distinction between “meaning” and “meaningful” suggesting by adding the “-ful” suffix that things we find most interesting and worthy are those that become increasingly engaging and provocative, that is full, as we give them our attention. That the “meaningful” are those things whose “meanings” in the sense of single articulable derivatives of something multiply and complexify as they are acquired. I prefer to increase the fullness of the meaningful than to reduce something to a single meaning somehow concocted. Yet even an apology for the “chock full o meaning” approach is something of a backfilled effort at saving meaning.

It is nearly impossible to separate meaning from reason and articulation and when I do my best to understand why I and others find anything meaningful or even elect to articulate

some meaning, I have to acknowledge that the energy source for this effort is deeply rooted in a feeling kind of knowing, in a felt sense of coherence, rather than in the results of some carefully calculated objective dispassionate process. Meaning emerges because it seems to promise the feeling of coherence. Argumentation to establish meaning is invariably driven by the feeling of coherence. Yet, even if we arrive at what we believe is “the meaning” we immediately have to explain and defend it against challenges, threats of incoherence. We should just come clean and look to some standard not falsely dressed in objective criteria or reason. Coherence trumps meaning.

I believe an account of coherence is needed. The trick is to account for coherence without attempting to nail down its meaning. The term is widely used, almost always without discussion, as though its presence or absence is obvious and in a sense it is. That the term is taken for granted, that the term is naturalized, is important in suggesting that coherence is not charged with disagreement and debate (yet!). However, what feels natural, such as self-movement, can yield insight and deeper appreciation when explored.

One way to think about the criteria for coherence compared with meaning based on reason and facts is the widespread presence through the world of strongly opposing positions, even stubbornly held. If such strongly held positions were all based on facts, reason, objective argumentation—which I think is a widely held belief—then there ought to be, as is purported possible in the natural sciences, an objective means of settling all such differences. Yet, of course, we know this can’t be done. We know that we often consider our own positions to be based on reason and objective facts, which means that (and this valuation is widely held) those that have different views from our own are simply “stupid.” A fact and reason based argument rarely if ever convinces those who oppose our position. “Yes, but ...!” This failure of reason suggests (I’m offering an objective reason based argument here!) that the “I’m reasonable and my position is based on objective facts while you are stupid and wouldn’t know a fact if it bit you” is likely not a very useful method of increasing discussion despite it being the one most attempted. If however we were to understand that even our most reason and fact based positions are always held because of how they make us feel, we’d perhaps stand a chance of at least a prayer for a shadow of empathy in ourselves. Surely we have to acknowledge that we take strong positions on topics we consider important because such positions feel coherent. They make sense; they feel right; they seem obvious; such positions defend against the looming presence of incoherence. Argumentation comes later motivated by the ever looming threat of incoherence as a backfilling to the certainty of our feelings that simply are.

Surprise

[Aristotle on surprise?? Epigram]

Comment [SG69]:

Charles Sanders Peirce spent much of his life reflecting on what he often called “abduction” (in physical terms, a movement away from the center) or “hypothetic inference,” a term that perhaps offers a more immediately comprehensible sense of his concern. How do we think up something new? How do we invent a hypothesis? Put another way, how do we know to embrace a certain idea when there are infinite possible ideas? I’ve encountered this issue of novelty and freedom a number of times in this book. There is this sense that to pursue knowledge about something we must already know what we seek. Such

foreknowledge is the key to hypothetic inference. If we truly don't know anything at all then all possibilities are equally interesting and viable to pursue. Michael Polanyi in his 1974 book *Personal Knowledge: Towards a Post-Critical Philosophy* took up this notion and concluded that should all things be truly objective, that is equally interesting, then we'd study only interstellar dust because there is more of it than anything else in the cosmos. But, if we have any interest at all, we have leanings, a best guess, a hunch, and these feelings amount to a kind of knowing before we know in the more reasoned and factual sense. Of course, "interest" now becomes the concern and I'll just suggest here, consistent with Polanyi, that accumulated experiences are distinctive to biography; everyone's accumulated experience or knowledge is undeniably personal. Peirce held that the forms of inference with which we are more commonly familiar—induction and deduction—create not a whit (his term) of new knowledge since they are regularized reorganizations of relations or data. However, these inferential methods are doubtless essential to confirm our hunches and to extend our guesses. Abduction then, he believed, deserves the greater attention since it initiates the processes that can then be carried out to extension and confirmation by these more quotidian means of inference.

Peirce described the hypothesis in terms of a syllogism:

The surprising fact, C, is observed;

But if A were true, C would be a matter of course,

Hence, there is reason to suspect that A is true (5.189).

Of central importance in this syllogism is that "C" being identified with the term "surprise" initiates the inferential process resulting in hypothesis. No surprise, no hypothesis. Further, it seems that "matter of course" (coherence) is the measurant that precipitates an acceptable hypothesis, a hypothesis that can be moved on to induction and deduction. Hypothesis cannot arise, initially at least, from hypothesis; this would be "deduction" rather than "abduction." So we need then consider a fuller account of "surprise" and its absence or its dissipation described by the term "matter of course."

While on the surface surprise would suggest an awareness of absence of fit, that is, an incongruity, this understanding isn't adequate in that it would imply that surprise is a response to some logical or reasoned condition. Yet, surprise comes first as Peirce presents it. Surprise is the emotional awareness or expression of incoherence itself, not a particular product of a logical or reasoned determination based on known criteria. The very absence of the possibility of such a reasoned process—left to induction and deduction—is what distinguishes abduction. Abduction is something that seems to happen to us; something beyond our objective control; not a result of a logical or reasoned process conducted by us. This sense of things abductive resonates with the alternative use of the term abduction as synonymous with kidnapping; we find ourselves captivated or kidnapped by a feeling, not by a logical or reasoned position. Being the first statement in the syllogism, "surprise" precedes and cannot be the product of any processes that might lead to the determination of "matter of coarseness." Surprise then is a feeling of incoherence that is dissipated finally, if momentarily and tenuously, by a feeling of matter of coarseness or coherence. The change in feeling, the introduction of coherence or the possibility of coherence, occurs in connection with the dawning of hypothesis.

Any account of coherence then must begin with the acknowledgement, the very deep understanding and appreciation, that coherence is not motivated by, the product of, the interests of logic or reason, but rather by the felt relief from the suffered discomforts of “surprise” or of the incoherence that precedes hypothesis. Since the processes of logic and reason proceed on the basis of an existing hypothesis, explicit or implicit, then the process of hypothetic inference, or discerning the awareness (an emotional marker) of coherence, cannot then be a strictly logical or reasoned process. However, once a hypothesis occurs it must seem almost obvious, looking back, that it arose as a process of inference subject to reason and logic. I believe it is this copresence that so engaged Peirce throughout his life. The copresent implication of hypothesis is that the coherence won of hypothesis entwines both the promise of fit as well as the constant threat of its absence. The life history of a hypothesis is limited to the threatening constant presence of a “maybe not” accompanying the promising “maybe” of hypothesis. The “matter of course” is always barely keeping the uncomfortable “surprise” at bay. Coherence is then not the feeling associated with completely uncontested and unchallenged established law, but rather the feelings accompanying the pursuit of defending belief, persistence, hope.

Coherence is akin to, and I think it is dependent on, the feeling that accompanies smooth human movement. I’m referring here not to something unusual, but the most quotidian movings of walking and lifting a spoon of ice cream to one’s mouth. Coherence is the feeling of the marvel that these actions can even occur. I suppose this is a bit romanticized; I intend to refer to the feeling of the dependable taken for granted seemingly effortless performance of moving smoothly about as living beings. The feeling of smooth moving is a primary experience for animate organisms. The feeling of moving is the feeling of living. The feeling of coherence is akin to the feeling of moving/living, so it can simply not be separated from a feeling of vitality. Threats to or decline in smoothness of movement are common signs of loss of vitality, illness, aging, loss of freedom. Thus we hold almost desperately to positions (gestures and postures) that feel coherent to us as though our very lives depend on them; and surely in some real sense they do. Certainly “smooth movement” seems a slippery notion, but it need not be as I will discuss much more fully below.

There are often physically observable markers of surprise in facial expression and postural comportment. I suggest that, while these may be culturally and historically and psychologically informed, the bodily markers of surprise are fairly universal in both their production and their recognition. Further, the presence of these physical markers occurs at a very early age. Surprise itself is physically manifest often with a sudden jerky movement or startle.²⁹⁶

Comment [SG70]: develop

Neuroscientist Michael Gazzaniga was interested in showing that, from infancy, our brains are designed to interpret. He recounted the research done on infants to discern what knowledge and types of awareness are built in to being human and those that are not. Since infants cannot answer questions, an infant’s knowledge is measured by its reactions as reflected in its facial expression and bodily comportment. Infants have little or no change in expression or body comportment for things they expect or already know, while

²⁹⁶ (cite Gazzaniga’s article and explain a bit)

they show an expression of surprise for things they do not know. Gazzaniga and others are focused on documenting that infants are pre-set with some knowledge. What these scholars ignore, but take for granted, is, to me, the more interesting thing; and this is that babies have obvious bodily responses to surprises. Yes, “surprise” is the word Gazzaniga uses to describe it. Also in a figure²⁹⁷ that Gazzaniga offers, the infant’s surprise is graphically shown by a thought bubble with an exclamation mark and a question mark in it (!?); an interrobang.

That these markers occur in infants might suggest that hypothetic inference or abduction occurs prior to the acquisition of language or reasoned thinking skills. Infants simply do not dissipate the surprise with the formulation of a formal hypothesis, yet an implicit hypothesis is nonetheless inferred and inhabited without conscious awareness, as is the case with almost all such human abductive processes. In pre-language children, surprise is often the response to the accumulating expectation regarding smooth movement, continuity of the movement of an object behind a screen. Such evidence supports the association of coherence with smooth movement. I’ll develop this notion of smooth movement more fully in the next section.

Peirce called abduction a “feeling kind of knowing”²⁹⁸ and this connection can inspire us to suggest that coherence, as also incoherence, is based primarily on “feeling.” Now, in light of the current vogue to foreground “body,” it might be tempting to suggest that since coherence is not the determination of reason or logic it is then not a function of “brain” or “mind.” We must resist this temptation, because I believe that “feelings” are as neurologically based as are any processes; yet I would want to consider that “feelings” are not possible apart from the biology. Feelings, sensation, perception are biological and they are based in movement and touch; at the core they are inseparable from the proprioceptive exchanges where neuron, muscle, and bone are different names for a single organic structure and process.

Surprise is copresent with “I can dos” and with “self awareness”—that is, with the fundamental distinction between me/self and the environment even if prior to a full conscious awareness. Because surprise is something felt it is always “my surprise;” it is inherently subjective. While we can often identify the markers of “surprise” in others, we do not experience these markers as “my surprise” any more than we are capable of experiencing the pain of another, yet we can easily identify that another suffers pain. This aspect of surprise then suggests to us that coherence, inseparable from surprise and the dissipation of surprise, is inseparable from the experience of the integrity, the organicity, the unity, the distinctiveness, the separateness, the ownership that we identify as “me.” Because surprise signals incoherence, it is the feeling of threat to the very wholeness that I label “me” or “my.” Yet, mostly surprise arises in the encounter and interaction with the environmental context in which our self-moving is realized. Surprise, thus also coherence, is a dynamic of the copresence of self and other, the animate organism and its living environment.

²⁹⁷ Ibid., Figure 6.2.

²⁹⁸ Peirce ...?

Coherence then is a human disposition towards copresent implications of feelings. What is most important at this point is to propose that if coherence does not arise in the reasoned resolution of the logically impossible—two separate things cannot be copresent—then it must occur as the felt comprehension that the implication of copresence is vitality. This is why coherence—the feeling of vital importance—always trumps reason. This principle is true in the sciences in that scientific inquiry unfolds in service to the hunch or best guess, a feeling of coherence, that gives rise to hypothesis. This principle is true in politics where political action and discourse are pursued often seemingly blindly because the feeling of coherence cannot be disconnected from vitality, from what is essential to life.²⁹⁹ This principle is true in religion where religious belief and practice are openly based on propositions that are completely untenable in a world of facts and reason.

Smooth Movement

[can Stern's affect ... be included?]

I have suggested that coherence is modeled on the experience of smooth movement. This notion may seem a bit sloppy for several reasons. How can one possibly distinguish in any very clear sense the qualifier “smooth?” Furthermore, if one could come to some notion of smoothness, how can that quality be a primary factor in the neurophysiology of movement? Despite these issues, it is fascinating and important that the classic studies of Russian physiologist, Nicolas Bernstein—studies that spanned the 1930s through the 1960s that established the foundations of contemporary movement theory and studies as well as coordination dynamics—explored movement in just these terms.³⁰⁰ A brief note on his work demonstrates the importance of the claim of the link between coherence and smooth movement as well as the core principles of coordination dynamics and why coherence has value over meaning.

The issue tackled by Bernstein was how smooth and coherent movement is possible once it is realized that it is impossible to explain and understand such movement on the basis of programs confined to the central nervous system. Throughout this book I have worked consistently from the basic understanding that movement is process (never being in any place, but always in transition between here and there) and it always involves some other (environment, context). Thus moving, as Bernstein noted, is always context dependent in ways that are not predictable because the context presents factors that are external to the organism. Even the movement in progress has an impact on itself, folding back on itself in part because movement involves a mechanical process that impacts the physical system of the body while movement is occurring. Despite these factors, Bernstein recognized that movements in living organisms are morphologically coherent and holistic forms. We, as all walking organisms, are able to walk while encountering obstacles of endless variety,

Comment [SG71]: it should be I think, but later in chapter or related to Bernstein's work

²⁹⁹ A simple and obvious example is that both sides of gun rights are argued on exactly the same value, the saving of life; no amount of data or argumentation is likely to change either side one whit (good word Peirce).

³⁰⁰ Bernstein's classic work *Coordination and Regulation of Movement* was published in English in 1964 and the importance of Bernstein's work was reviewed by Whiting???? (1984) and again by Thelen and Smith, ??? (???), 75-78.

variations in surface, footwear of varying weights and stiffness, varying gravitational contexts and much more. No sensorimotor program can account for all of these conditions. Movement has nonlinearity unavoidably (even importantly as essential to its nature), yet for animate organisms its form is more or less smooth and holistic. Bernstein's question then was how this is possible; how can the many and diverse parts of an organism cooperate within a diverse and changing context?

Bernstein discovered that it is the interactions among all of the constituent elements dynamically engaged in self-moving that result in the patterns of movement. As Esther Thelen and Linda Smith summarize his work, "What organizes walking and other movements . . . is the relationship between all the elements of the moving segments *and their perception of, and interaction with, the periphery*."³⁰¹ Movement by an animate organism is a self-organizing dynamic system. Importantly, the coordination dynamics of the organic system of movement is not confounded by the presence of indeterminacy (freedom or opportunity) but it is this indeterminacy that is key to its character. As Thelen and Smith describe Bernstein's findings,

the very freedom of the system to assemble and reassemble in response to changing needs is the wellspring for new and adaptive movement forms. If movements, or any behavior, are rigidly programed, there are no sources of change. . . . Movement is the final common pathway for all human activity. Functional movement is the melding of the mind and the body and all the components thereof. But equally compelling is the complete and intimate relation between the organism and the physical and informational qualities of the world. The animal must sense, adapt to, and integrate the force and informational fields that surround it in order to move effectively and efficiently. There is no such thing as a "pure" or decontextualized walker. The essence of walking is only in its construction during its execution.³⁰²

The movement is constructed from the dynamics of moving during the process of moving. This perhaps sounds simple, yet it restructures the very heart of how we have typically attempted to account for movement.

Thelen and Smith also discover that in the development of binocular connections, it is the self-movement that exerts control of behavior that plays an essential role in establishing ocular dominance achieving coherent functioning of the two eyes.³⁰³

In their *A Dynamic Systems Approach to the Development of Cognition and Action* (1994), Esther Thelen and Linda Smith are interested in Bernstein because they find that his

Comment [SG72]: Maybe need to move or drop this one or make it a footnote

³⁰¹ Thelen & Smith, 77 (ital. in T&S)

³⁰² Thelen & Smith, 77. A quick note here related to robotic walkers is of interest. As I am familiar with the efforts to achieve walking they cannot help but retain an approach based on a central program designed to respond to specific types of external conditions encountered and there is almost no possibility, because of the linearity of purely mechanical/electronic machines, to respond to variations in its own changes. Because robotic walkers do not have dynamic self-coordination they will never achieve smooth movement in unpredictable contexts.

³⁰³ Thelen and Smith, 159.

dynamic systems approach applies to all action but also to cognition. I have discussed coordination dynamics several times in this book. Since movement is accompanied by qualities of feeling, I suggest then that such quotidian actions as walking and reaching provide the feeling base for identifying coherence in any context—action or cognition. As “movement is the final common pathway for all human activity,” then the feeling of coherent movement such as experienced while walking provides the feeling standard for the ongoing dynamics of any system we encounter. As there is no decontextualized walker, walking is always the engagement of complex relationships to achieve smooth, efficient, and coherent movement despite the constant presence of factors that threaten this coherence. And, indeed, we do occasionally stub a toe or trip on an obstacle or even fall down. Such presence of nonlinearity is the price of freedom and opportunity. Coherence is always being dynamically won by engaging obstacles, incoherence.

The coordination that effects smooth efficient movement is evident even as infants learn to reach. Thelen and Smith discuss a range of studies that focus on how infants learn to reach continuing on to chart the various movement dynamics of the trajectory of adult reaching. It is a marvel really that we are able to, seemingly effortlessly, reach out and pick up a cup of coffee and get it to our mouths (which we cannot see) without knocking over the cup or spilling the contents all over everything. What is fascinating given all the variables that exist among reachers and reaching contexts is that, as revealed in Bernstein’s studies, there occurs a “characteristic smooth, single peak of acceleration and deceleration, with the same amplitude and characteristic frequencies” among all these studied reachings.³⁰⁴ This observation suggests a dynamic interplay among the context, the body mechanics, and the biology, yet with purposeful self-movement as the control parameter. From these studies of the neuromechanics of reaching, Thelen and Smith summarize that

the CNS [central nervous system] is actually working on the dynamic and ensemble characteristics of the entire controlled limb rather than its movement pathway or the firing patterns of the muscles. . . . there are no explicit a priori instructions or programs for either the trajectory of the hand, joint-angle, coordination, or muscle-firing patterns. . . . The kinematic properties need not be explicitly represented anywhere because they arise secondary to the dynamics.³⁰⁵

From the clumsy, jerky, erratic, groping efforts of infants reaching progressively and rapidly develops into a honed skill characterized by smooth movement. It is the repeated reaching actions that construct the skill. Whereas with any skill we may first be concerned with parts and mechanics (although infants are clearly not consciously so concerned)—fingers, elbows, wrist rotation, arm, shoulder, torso and whole body, effects of gravity, and so on—but as skill is gained we can suppose that the central nervous system ensembles dynamic patterns of skill in which the seeming endless numbers of neuromuscular mechanics arise secondarily to the skilled performance dynamics directed to task. According to Thelen and Smith, this way of understanding reaching in terms of dynamic ensemblings give us insight into explaining “how actions remain flexible and skilled in the face of inevitable and often unpredictable perturbing forces arising internally from the

³⁰⁴ Thelen and Smith 253, 263.

³⁰⁵ Thelen and Smith, 264

movement of the limb or externally from the environment.”³⁰⁶ Dynamics arising through repeated experience are ensembled around values of efficiency and smoothness. Such values are then constantly experienced in self-movement (during the process of moving) and establish base criteria for coherence. Summarized clearly by Thelen and Smith,

A reach is a dynamic ensemble that does not exist separately from the actions of muscles and joints, from limbs with biomechanical and kinematic properties, and from infants’ motivation to reach and group objects. The global structure of a reach is *not reducible* to these components, but is only explained by understanding how these components interact in real time. Thus reaching is not performed, nor is development pushed forward by magical maturational processes. Rather, the development of reaching is a result of changes in the heterochronic underpinnings of the behavior itself—changes that emerged from the activity of the organism.³⁰⁷

It is the moving—the experience (“now” and accumulating) of repeated movements—that creates and shapes the ensembles that are engaged in the skilled performance of reachings. This position shifts (reverses) the usual sense of cause and effect, but more importantly it offers a much more complex and rich account. Action influences, quite literally, the construction of brain. But perhaps more importantly there is no separation between self-moving and neurobiology, “everything is dependent on everything else,”³⁰⁸ and to focus on dynamics and ensemblings is a way of more deeply appreciating the complexity, specificity, and vitality of the organism.

I’m holding that the constant experience of smooth movement establishes the feeling parameter for the identification of coherence and this is largely because the smooth movement attests to the coordination dynamics of a complex organic self-adjusting reticulated system that cannot be accounted for through linear analysis. To comprehend appreciate and analyze such systems is the work of coordination dynamics.

The most exciting aspect of Bernstein’s work, and as it has been developed by others since as considered by Thelen and Smith, is, to me, that it is the nonlinearity, the freedom/opportunity, the novelty that is at the essence of how the system works and that coherence is based ultimately on movement that occurs, he understood, because of imbalances of forces caused by changes in muscle tension.³⁰⁹ Such a dynamic system in movement defies meaning in some sense of explanation or a contained principled or lawful system. It is the very openness, the freedom, the unpredictability that characterizes the power of the dynamics that achieve coordination, smoothness, efficient functionality. The promise and felt presence of coherence in the presence of the constant threat of incoherence—alternately the presence of freedom and opportunity and novelty—is a far more dynamic and fitting way of comprehending moving, yet it suggests that moving must also be appreciated in a more global sense also as vitality.

³⁰⁶ Thelen and Smith, 264

³⁰⁷ Thelen and Smith, 279

³⁰⁸ Thelen and Smith, 332.

³⁰⁹ This tension, often engaged in oscillation and a key aspect of posture, is related to tone or tonus, which I discuss in various places in the book but most especially in Chapter 8 “Fat Present.”

The Complementary Nature

In their 2006 book *The Complementary Nature* J. A. Scott Kelso and David A. Engstrom ask why binaries or complementary pairings occur so persistently. They show that the approach most common to understand binaries has been to oppose the two parts and attempt to reduce them to unity. They want to show that the members of the pair are complementary and they use Nobel laureate Neils Bohr's statement "*contraria sunt complementa*—contraries are complementary" as a mantra.³¹⁰ They introduce the tilde (~) to join the members of the pair to indicate that there is a complementary relationship between the two, rather than simply oppositional as I suppose they feel is indicated by the slash or dash. Still they focus on the "in-between" and on "reconciling" the two. The organization of their book takes this approach. Section One is concerned with philosophy, Section Two presents the science of coordination dynamics, and Section Three turns to the reconciliation and forging an in-between. Interestingly—while they cite Maxine Sheets-Johnstone's work on movement, and they mention movement regularly throughout including reference to a bunch of movement theorists/analysts and they even discuss Newton's Laws (which are about movement)—they do not include "movement" in their index and they do not give movement any particular attention other than incidental to discussions of other scholars. They do not apparently see movement as of core importance to coordination. While they understand and acknowledge what I have been referring to as the Humpty Principle—that is, once in pieces how it is impossible to put something back together again—they still try to deal with the pieces by articulating an in-between, which they identify as a "resolution."

Their solution is resolution/reconciliation accomplished by placing one member of the pair against the other and then trying to reveal something in-between them, some dynamic. In a very large example that shapes their book, they persistently identify philosophy as metaphor and science as real which in terms of the science~philosophy pairing hardly allows them to be a complementary pair since the relative values assigned to each term pretty much demonstrate that they do not stand any chance at all of accomplishing a reconciliation or even an equal pairing; what can compete with the real after all? Their tacit valuation of metaphor as "not real" or "just metaphor" reveals a prejudice even before they can attempt some tilde connection suggesting complementation. Their use of metaphor is without exploring the possibility that it is a perfect example of the structurality they want to construct, a metastability that is key to the coordination dynamics for which they are so well and deservedly known.

What I believe is key is that, from the time of Frederick Schiller's 1793 articulation of play through descriptions by many others—Gadamer, Derrida, Bateson, Baudrillard, Gill³¹¹—on play and seduction, there already exists a powerful strategy for comprehending complementaries without the need for reconciliation or in-betweenness.³¹² Such an understanding recognizes the presence of a "third thing" rather than reconciliation of two

Comment [S73]: Get name right

Comment [SG74]: Did I develop this before and if so then refer to that here ... if not then I have to develop it here.

³¹⁰ Kelso & Engstrom, Complementary ... 7.

³¹¹ Cite main works here ... these are avail in s-g.com on play

³¹² Donald Handelman "?????" approaches play in something like "in-betweenness" and I have shown ???where??? that this doesn't really work.

by patching. This “third thing,” the relationality between two things, is very different and as Schiller stated so well it isn’t one member of a dyad opposing the other, one balancing with the other, but each of the pair both enabling and limiting the other and through this ongoing tensional oscillating process as they come into concert (there is that tonus metaphor again) the third thing arises and it is a virtual, a structurality, a dynamic. That third thing is, in Kelso’s terms, a metastability, the dynamics that hold together tensional pairings. The third thing is the dynamic of a twoness that is also a oneness; a copresence with profound implications. It is often referred to as “play.”

The important thing in my work is that coordination/coherence is based in movement, in the playful oscillatory movement that, as it interacts in self-adjusting coordination dynamics, creates what Schiller referred to as being “in concert.” We might think of this also as resounding and reverberating and resonating to use other sound related terms (I’ll develop these more fully in the next chapter). Coordination dynamics shows that biologically this relationality is a fundamental functional property of the living organism, via reentrance, internuncial net, proprioception, ensemblings. Further that copresence is a far more accurate and certainly more interesting way than is reconciliation of comprehending and appreciating the dyadic dynamic because it actually allows the impossible to be possible, that coherence is generative only when copresent with incoherence.

Mingled Bodies

[Skin/touch: Serres in “5 Senses” in “Veils” chapter discusses how the ME and the ONE arises from the 6th sense (the only internal sense) thus, I would argue, the bodily experiential base for coherence (the sticking together) see pp. 54-57 and I think later in this chapter as well. He doesn’t consider this 6th sense as proprioception however and this is where my naturalist complement will be important] Serres profound discussion of touch/skin in “5 senses” which give rise to “me” “mine” which is a fundamental sense of the coherence of the many and the one in the body and the mingling of bodies w/ the world

In his provocative *The Five Senses: a Philosophy of Mingled Bodies*, French philosopher Michel Serres is concerned, among many things, with the coherence of the variety of bodies that comprise us. How can we be “one,” how can we be “me,” when we are a collection of so many disparate things? This is a variation of the question I’ve long been concerned with. The fundamental issue is coherence when variety and diversity and multiplicity are so prominent. Serres begins, not with vision, the eyes, but with touch, the skin. On the model of Democritus, for whom all senses were really only variations of the one sense touch, and Aristotle (see p. 2 by Connors), Serres understands that the “senses are nothing but the mixing of the body, the principal means whereby the body mingles with the world and with itself, overflows its borders.” (see p. 3 Connors). Serres observes that, as Condillac held, “the soul flares wherever and whenever the body touches upon itself.” (connor 4) Awareness, a sense of “I” and “One,” meaning a coherent oneself, arises with touch. As a sensation, as a feeling, touch gives unity among diversity, awareness of coherence, connectivity between self and other, and the entwining among the various bodies/senses. Serres writes,

Comment [SG75]: This section has promise but I need to expand Serres and deal w/ M-P better in light of neurobiology. Reread Serres, Connors, Edelman ...

Comment [SG76]: Drop when done.

Comment [SG77]:

Comment [SG78]:

Comment [SG79]:

Our skin resembles that of jaguars, panthers and zebras, even though we do not have fur. The pattern of the senses is displayed there, studded with subdued centers and spotted with marks; the skin is a variety of our mingled bodies.³¹³

Reticulated, striped and spotted, with many senses, the skin itself attests to the many variations that are experienced both in the continuity of skin and in the subjective creating and affirming experience of touch. Yet, it is not only the skin, but also the “inner touch” of proprioception that conjoins self-movement and touch; both are implicated in what has long been considered the common sense, coenaesthesia. It is the rise of feeling and the qualia of feeling that it is inseparable from “me” and “mine” and my oneness, that confirms that coherence is feeling based and won as the remarkable interconnection among wild variation not as a steady state, but as a mingling process. Touch is fundamental to Serres’s philosophy of mingled bodies.

Maurice Merleau-Ponty made much of two hands touching. This became the basis for his flesh ontology. But when he said that they are at once two separate hands yet had a belongingness (need his terms) it was because they are of one body. What he didn’t do was to fully consider how it is that we know that two hands are of one body (need to reread him on this). I’d suggest that it is the inner sense of touch, proprioception, that provides this. See Serres “5 Senses” p. 19 & 22 for disc of how the “body knows the ‘I’”. That is we sense both hands as “my hands” and this inner touch (conjoined perhaps with the outer touch) are engaged in the most fundamental criteria of coherence. To feel, to sense, “my” and “I” is the core criteria for all coherence. It is the moving touching experience that then is prosthetically projected to all other coherences. [discuss here the copresence of two hands touching ... not reversibility so much as copresence ... and remember that Sheets-J didn’t buy it either]

Certainly an issue that has long engaged me is how we can feel this sense of unity and wholeness, this organicity, when our physical bodies are so complex and with parts seemingly so at odds with one another. Further, one of the most amazing things about the architecture of our brains is that there is no central clock that coordinates the utter chaos of neurological signals; nor is there a master administrator in the brain (a brain-based location of “me” despite some who seem bent on locating such a “spot”) that is directing all the other parts of the brain on what to do. [Edelman’s theory. See p. 25 ... brain does not work on basis of logic and does not have internal clock. Key to develop Edelman here because he is neuroscientist and we tend to assume that brain/mind simply works with logic. Even Gazzaniga sees left brain as administrator. Edelman’s theory then may offer the basis for a brain-based understanding of coherence that is not logic based; that would be cool. If I expand this essay to the main chapter in MTS that deals with the brain location of skill/concept etc this discussion of Edelman’s would need to become an expanded and extensively discussed section. Would be worth it.] Still a great issue with biology is the quotidian sense that I am “me,” a whole coherent unified being. I suggest that the awareness of this condition of being “me” is the very basis of our criteria for coherence. Things are coherent if they feel coherent to me and by me. And such feelings are always

Comment [SG80]:

Comment [SG81]:

Comment [SG82]:

Comment [SG83]: I may have done this already

Comment [SG84]:

Comment [S85]: Reconcile with my discussion of smooth movement as criteria

³¹³ Serres Five Senses, 52

based in self-moving/touching; in the smoothness or completeness of organic self-movement.³¹⁴

Yoda and Joseph Smith: Story, Myth, and the Impossibles

[See Evernotes for several articles. Narrative structure is conceived w/ movement and agency SJ434]

[the Navajo section from Religion book]

For several decades my research centered on Native American cultures, especially those in the American southwest. I can see now that those studies have deeply influenced most of what I am interested in today even though I shifted away from Native American studies long ago. My fascination with ritual and dance and movement and gesture is rooted in my early experience while in regular contact with Native American cultures. As a student of religion I was told by academic advisors that the study of Native Americans wasn't possible primarily because their languages, with very few exceptions, do not have writing; thus no "texts." Yet Native American cultures are saturated in story with constant reference to stories of a great variety from simple entertainment (that usually also has some moral or instructional value) to grand formal recitations of epic myths of origination. These too were of great interest to me³¹⁵ and it is clear they continue to inform my current interests. And, of course, as my comparative studies expanded from culture-to-culture, continent-to-continent, I found story to be ubiquitous. The late folklorist Del Hymes and a recent generation of folklorists demonstrated that not only is story fundamental to cultures, as has long been known, but so also are the performances of these stories that vary from teller to teller and context to context. The plasticity of story as demonstrated by the extent of its range of possible tellings is complemented by the tenacity of story in that it often persists as a particular story known to many over long periods of time. Story is a perfect medium for tradition. It is also a perfect example of a process—for story is a process rather than a thing—that serves the dynamics of coherence.

Years ago I agreed to revise my book *Native American Religions* primarily because I wanted to do a little storytelling experiment or exercise. Although I had to make a hard sell to the publisher I was finally allowed to add a section to the book that included my own stories related to Native Americans. Scholars likely tell their personal stories in everything they do, but not in the more interesting form of personal story. Usually the personal experiential dimensions get buried in the guise of academic authority. There are a few exceptions such as the "entry narrative" included at the beginning of many ethnographies and the "when I was a dancer" narrative included at the beginning of many academic dance studies; both serve interestingly to establish authority on the basis of personal experience. I just wanted to tell some stories. I introduced that section this way, "I particularly like the ambiguity of the word story. It is commonly used to refer to myth, folktale, anecdote,

³¹⁴ Thelen and Smith (195-96) offer a number of studies that demonstrate that self-movement serves as the "setting event" or as a control parameter for the development of cognitive, perceptual, and social change. Movement is the driving and shaping force of development.

³¹⁵ Native American Mythology ... w/ Irene Sullivan ???

Comment [SG86]: delete when cleared

Comment [SG87]:

history, as well as an out-and-out lie. Often we never know.”³¹⁶ To me the most interesting thing about story is that it often implies artifice if not simply a lie, but story often boldly goes forth as being true and actual and authentic. Story is a kind of lie that tells the truth. Story is a narrative structure that has the dynamic of metastability, the entwining of two opposing positions—true and false. We know, in some sense at some level, that story isn’t what it puts itself up to be (an actual true event), but we also sense that somehow this very dynamic (knowing it isn’t what it is) is what makes it engaging, memorable, valuable, important, provocative, and transcending the details of the story. Story also entwines as its drama the sense of tension or conflict and opposition and irresolution. Yet the narrative thrust or movement is the promise that such opposition will “in the end” arrive at some coherence, even if it is one that folds the dynamics of tension into a new dimension, often the lives of those who hear the story. The engaging power of story is its moving thrust toward the promise of coherence despite the tensions of the threat of incoherence. Story is then whole, but it exists not in its wholeness as an object, but in the process of its telling and being told and being heard. Story, as dynamic narrative moving process, a partialness dynamic relationality to a wholeness, is scarcely separable from the dynamics of coherence. Both story and moving are dynamic processes realized in felt experience, not things with explicit meanings or specifiable criteria. Story also has the same odd dynamics as perception. The whole of the story is somehow foreshadowed and therefore in some sense known or prefigured as the story begins. In story there is an “end” or a “whole” that is present in some sense at the “beginning.” The copresence of the whole along with all of the varying parts of story is what makes it story as well as what drives the story process. Story is the dynamic interplay of conflict and coherence. The durability of story correlates with the degree to which this dynamic of copresence transcends the telling/reading. Those stories that end with a predictable artificial simple resolution are typically the ones soon forgotten. The coherence won is no longer copresent with the endless presence of the possibility of incoherence; thus there remains no tension or drama or vitality. Those stories that end with a sense that coherence is an allusive yet vital dynamic force that persists through life are those stories that continue to generate the ongoing movement that is distinctive to story. These are the stories that allow incoherence to be ever looming, if at the margins or in the shadows; there but just beyond, even beyond the narrative’s end. These are the stories that demand telling and retelling.

In the formative era of the comparative study of religion that occurred in the third quarter of the twentieth century, the principal issue was to establish patterns that were understood to define religion as an aspect of being human; a set of patterns that would resolve religious difference as but differing manifestations of defining patterns. Thus differences disappeared as specific cultural and historical instances were found to be manifestations of underlying universal religious patterns. The highly influential scholar Mircea Eliade was a principal proponent of this approach. For culture the renowned anthropologists Sir James George Frazer and Edward B. Tylor were late nineteenth/early twentieth century practitioners of the same patternist approach to cultural comparison. A shift in the academic study of religion came in the late twentieth century with scholars led by Jonathan Z. Smith who held that incongruity and difference are what make comparative studies

³¹⁶ Sam Gill, *Native American Religions: An Introduction* (Wadsworth, 2nd ed. 2004), p. 129.

interesting and, of course, valuable. Smith argued energetically against the forced resolution of incongruity into common or universal patterns. Incongruity appears to be something that, even at the level of the operation of the brain function, initiates action and movement, there are more options for movement than simply dissipating the seeming intolerable difference. Indeed, while this is the most common view of what happens, I argue that this is the least interesting and maybe even least common result.

Comment [SG88]: clarify ... too many this's

Comparison is at the core of the development of the study of culture and religion, it is the heart of inferential methods, and it is essential to thought. Understanding brain modularity and parallel processing offers insight into other important religious and cultural processes as well as human behavior. If we ask how we experience incongruity, we have to posit the juxtaposition of two or more factors held at once with the awareness, through comparison, of differences—copresence. A and B must be held simultaneously present in the brain (in two ensembles or neuronal groups that are processing in parallel) but that are interconnected with one another in terms of some common concern, that is these two modules are connected in terms of some specific potential commonality. This is the basic neurobiology of comparison and comparison is surely the foundation of all processing and knowledge. What is key here I think is that there is a shift in “feeling” that coincides with the shift from incoherence to coherence or vice versa. Incoherence corresponds with a “feeling” of energized iterations generating possibles; this feeling that drives and energizes inference eventually shifts in a quality that marks the promise of coherence. When the disparate and seemingly disconnected parts have the potential to become story the feeling quality of coherence, or its promise as a potential, arises.

Parallel processing and interconnectivity of neurological modularity demands a system to achieve coherence, this is the function of coordination dynamics. Coherence can only be understood as part of the nature of the unbelievably complex comparative neurological processing and the feelings that accompany the various phases in this processing. The fact is that, to keep from simply shutting down because of the conflicting incongruous simultaneously presented factors, we experience the rise of something on the order of the brightness or color confound, where we blend the factors together into a choice or an action or a word or a story or a hypothesis. This isn't so much a choice as the recognition of a confound, that things interact and interpenetrate one another, signaled by a feeling we associate with coherence. This is how our neurobiology works;³¹⁷ it is characterized by complex coordination dynamics. Differences are not explained away or reconciled or eliminated so much as they are interrelated and interconnected, brought into resonating copresence or concert or confound. Coherence is then the often-unconscious construction, via coordination dynamics, of a vital copresence, the harmonic connection of conflicting and competing tendencies. The harmonics are recognized by a shift in feeling. In other terms, it is the twining (or even blending) of the two (or more) into the one without destroying the two (or more); it is the storytelling that interrelates what are otherwise the unrelated, even the seemingly unrelatable; it is the congruity constructed by a comparative channel that can interconnect the disparate. It is clear that this is the way our biology is designed and has evolved. I think it is clear that all animate beings are vitalized by this

³¹⁷ See a discussion of this in terms of the implications of this based on the split-brain research of Roger Sperry and Michael Gazzaniga in BBM “??? Story”

capacity to process copresence; that should this remarkable and distinctive ability not be present animate organisms would simply grind to a halt because of unresolved simultaneously held incongruities that would debilitate and finally devastate.

What is perhaps distinctive of human beings is the capacity to construct verbal ensemblings that we call storytelling or mythmaking as inherent to the pleasure and creative capacity of being human; surely this process is at the generative core of religious traditions and cultural identities and even academic fantasies about knowing. Understanding this human style of processing surely we can see that what religious traditions and cultures do is to offer template ensemblings established through highly repeated acts experienced through ongoing life in a specific cultural and religious communities that can be used to creatively engage the exigencies of life experiences.

I want to insist that ensemblings do not explain away differences; they do not make up for ignorances; they do not fill the gap of stupidity. Rather, these ensemblings are complex blocks (Deleuze and Guattari) comprised of many contrasting, incongruent, even impossible elements that are held in dynamic interrelationships that interplay as the complex oscillating movement of life and vitality. From infancy what appears impossible or surprising is invariably more deserving of attention than the possible.³¹⁸

Comment [SG89]: Establish basis for this

We animate organisms, we biological beings, have evolved as integrated and interconnected parallel processors. As parallel processors we have complex reentrant coordination dynamics bent on (it is of our nature) constructing coherence (feeling-shifts) among the disparate without dissolving the differences. We can hold together apparent impossibles—the two that are one, copresence, metastability—and find in them the movement/touch structurality that generates life. Humans are distinct among animate organisms in concocting second order story/myth to articulate the impossibles and even third order reflections (retrograde movements, backfillings) to try to explain and understand how it all works and comprehend why we so love to hear and tell and rehear and retell these stories.

Science and religion (both in one aspect of their work are concerned with retrograde ensemblings) are not at odds with one another; they differ only in the genres and styles of the stories. Science trades in formal hypothetic inference whereas religions and cultures trade in stories (fictions), myths, and rituals. In some important ways they are the same. The narratives arising to express and investigate the dynamics of the interplay of coherence/incoherence are utterly commonplace: autobiography, worldview, tradition, metaphor, art, story, myth, ritual, and hypothesis. The importance and ongoing vitality of both science and religion is based in the success of retaining the generative vitalizing dynamics of metastability and nonlinearity in their stories/hypotheses; the interplay of incoherence and coherence.

Matt Stone and Trey Parker's musical "The Book of Mormon" is a delightful exploration of many things, story and coherence being among them. Perhaps like nothing else I can imagine—short of religions themselves that we often cannot get much perspective on

³¹⁸ See description of studies of infants that establish this point in Thelen and Smith, 223, 234.

because of our gestural predispositions—this musical shows this human penchant for seeking coherence even in what, on the face of it, is the patently ridiculous, impossible, and utterly goofy. In “The Book of Mormon” a couple of young Mormon missionaries arrive in a Ugandan village to convert and baptize “the Africans.” As they present the story of the origin of the book itself (Jesus in America and Joseph Smith finding tablets in his back yard in New York), their mere telling of this story (nicely dramatized by tableaux in the background) sounds to the Africans pretty silly and unbelievable. The Africans quickly dismiss it as ridiculous and useless. No matter how hard they try, the missionaries can’t seem to convince a single Ugandan to be baptized. Yet one missionary, Arnold, having had a childhood steeped in fantasy because of his social isolation is prone to making things up, goes a bit rogue (ventures off without his partner because he himself has been abandoned) and begins to make up all sorts of things which he appears to read to the Africans from his copy of *The Book of Mormon*; things that directly address the existential needs and concerns of the Ugandans like AIDS (including sleeping with girls as a method of cure) and poverty and female circumcision and the bullying murdering warlord in the next village who terrorizes everyone with his thugs and assault rifles. This emerging “Arnold revised” version of *The Book of Mormon* is influenced by Arnold’s long fascination with Star Wars, Star Trek, and a variety of superheroes. Arnold realizes that he is “sinning” in his “loose” presentation of the *Book of Mormon*, yet he is amazed and thrilled at the enthusiastic response of the Africans. The Africans love it—it speaks to them—and soon they all want to be baptized led by a lovely young woman; this first baptism sweetly eroticized. Eventually, in a musical within the musical the Africans portray to visiting Mormon officials their understanding of *The Book of Mormon* Arnold. And, of course, their version is based on what they believe is “in the book;” things that have begun to change their lives for the better. Not surprisingly the officials are outraged. When the Africans are told that their new religion is based on one missionary who made it all up, they quickly respond by holding on to the message and arguing that that’s what prophets do (that is make things up) and that such figures always “speak in metaphor.” The result for the Africans is what religious studies would call a “new religious movement.” But it plays both ways. The missionaries’ seeming success convinces these skinny white boys from Utah that they have become “African;” they celebrate becoming African in a ridiculously funny song and tap dance number costumed in their white shirts and skinny neckties. The show ends with Ugandans dressed in the same white shirts and neckties carrying *The Book of Arnold* going house to house ringing doorbells in search of converts.

We find/construct meaning (coherence) even in ridiculous unbelievable impossible things and the insights accompanying our feeling of coherence often change our lives and our worlds. The world is invariably a combination of Joseph Smith and Yoda and our very human biological construction assures that we always have ways of enriching life (or keeping it somehow livable) in this endless process of ensemblings in which unbelievable impossibles create music (sometimes Broadway musicals) welling out of a resounding cistern of primacy and potential. Humor and laughter are common responses to being confronted with and embracing the impossibles.

Separate the visual fields so the right eye cannot see what the left eye sees. Show a picture of a snow scene to the left eye; show a picture of a chicken foot to the right eye. The left eye connects with the right brain hemisphere; the right with the left. A special condition

Comment [SG90]: Not sure this is where the tableau’s are ... check for sure. It may be when the Africans are presenting to the Mormon officials.

pertains to this little scenario: the person looking at these pictures has had severed his *corpus callosum*, the neurological super highway that connects brain hemispheres, so his brain hemispheres work independently, a two-brainer. Now show the person groups of pictures visible simultaneously to both eyes from which he is to select an object that is related to each picture he sees. He correctly chooses, among a series of objects, a shovel to match the snow scene and he also correctly matches, among a group of objects, a chicken to correlate with the chicken foot. Okay, so what's the big deal? The left hemisphere has the special capacities for quantitative concerns and language and speech. Michael Gazzaniga refers to it as the "interpreter."³¹⁹ The right brain, which Diane Ackerman calls "the strong silent one,"³²⁰ is concerned more with emotion and intuition (a feeling kind of knowing). When this two-brained person is asked why he selected the shovel (chosen by the silent right hemisphere) his left brain must speak for the choice made by the right brain, yet it cannot communicate directly with it; no *corpus callosum*. Rather than being befuddled about choosing the shovel, he immediately responds, as Gazzaniga reports, "Oh, that's simple. The chicken claw goes with the chicken, and you need a shovel to clean out the chicken shed."³²¹

It appears that we are neurologically equipped to make up stories, to create narratives of coherence. An important function of neurological coordination dynamics is to create coherent narratives that can justify in retrograde style the actions we have taken, the world we experience. Note that what the left brain (and perhaps its connection with body) does automatically, instantly, naturally, and seemingly without conflict, is to examine the factors at hand—chicken, chicken foot, and shovel—all three apparently conjoined only in the left hemisphere, absent the snow scene, and then it constructs a narrative explanation about how these three objects relate. The coherence rests on the apparent logical argument: chicken is to chicken foot as shovel must be to something to do with chickens . . . uh . . . like to clean out the chicken shed. One small problem is that there is no chicken shed and the silent right brain hemisphere accurately selected the shovel to scoop snow and thus knows in some sense, but cannot tell the left brain.

Such behavior may be disturbing on the one hand. If we acknowledge this behavior, we must conclude that our left brains are habitual prevaricators and perhaps we should thank god for the moral control exerted by the right brain. But surely the creative intuitive right brain is otherwise occupied. To contemplate that this left brain hemisphere—the one most closely associated with rational thought and language—is built to make up stories raises complicated and potentially frightening questions about those rational, logical, objective processes we so strongly rely on in our studies, our research, and our lives. Yet, we might find the presence of chicken poop in this story a source of insight into our penchant for creating coherence that exists at the level of our neurobiology. Human beings are story-makers and storytellers, not just as an available creative choice, but rather as inseparable from our most basic neurobiological functions.

³¹⁹ Gazzaniga, pp. 124-29.

³²⁰ Diane Ackerman, *An Alchemy of Mind: The Marvel and Mystery of the Brain* (New York: Scribner, 2004)

³²¹ Gazzaniga, p. 124.

There is a conjunction between story and science and between story and belief. The structure of story proceeds from a condition of incongruity or incredulity, the threat of incoherence, to the creation of a hypothesis (or explanation) that can render this condition congruous, and then, perhaps finally, to continue on to recount evidence to support the concocted conclusion. Stories arise in the oscillating copresence of coherence and incoherence. That coherence is ever the momentary hedge against the constant looming threat of incoherence is why I much prefer to think in terms of coherence rather than meaning. Meaning seems so final, so resolved, so stable, while coherence retains the creative energetics. The scientific method: motivating problem, hypothesis, data, argument, conclusion. Belief is similar. Curiously, given our distancing of science and religions and other belief systems, as Gazzaniga shows,³²² both tend to focus prominently on supportive information while quickly dismissing, or simply ignoring, conflicting information. Seems as humans our energetics, even at the level of neurobiology, stem from the dynamics of coherence; we like a good story even if we have to dress it, retrograde fashion, in objective, disinterested, and technically correct outfits.

While I respect the immense knowledge and experience of Michael Gazzaniga's long career in brain science, there could scarcely be a greater divide between his beliefs and mine regarding what distinguishes human greatness; we like different stories. In his 1994 book *Nature's Mind* the conclusion to his chapter "Selecting for Mind" reads this way, "When the interpreter [left brain] goes to work on more complex events, the resulting hypotheses and beliefs about the world also seem resistant to change. Even though the similarities are striking [I think he means the similarity between hypotheses and beliefs], the quintessential human property of mind—rational processes—can occasionally override our more primitive beliefs. It isn't easy, but when it occurs, it represents our finest achievement."³²³

Frankly I'd prefer to identify my highest achievement with the capacity to invent chicken poop. I'll try out my own rational faculties here to retrograde my own story. It seems to me that rational processes are not engaged until a hypothesis is present. So where do hypotheses come from? Certainly, as I discussed at length in Peirce's account for hypothetic inference, they cannot come from rational thought.³²⁴ The issue is rather, how do we think a new thought? Or, put differently, how do we make up a new story (considering hypothesis a story with potential for broad application)? Gazzaniga was interested in showing that, from infancy, our brains are designed to interpret, to make up stuff. He recounted research done on infants to discern what knowledge and types of awareness are built in to being human and those that are not. Since infants cannot verbally answer questions, an infant's knowledge is measured by its reactions as reflected in its facial expression and bodily comportment. Infants have little or no change in expression or body comportment for things they expect or know, while they show an expression of

³²² Gazzaniga, *Nature's Mind*, p. 135-37.

³²³ Ibid., p. 137.

³²⁴ C. S. Peirce argued that this process has a rational base simply because hypotheses are so often supportable while a random hypothesis would not be; however, clearly for him this was not a conscious rational process. See below "Charles Sander's Peirce: Play and the Logic of Discovery."

surprise for things they do not know. Gazzaniga and others are focused on documenting that infants are pre-set with some knowledge. What these scholars ignore, but take for granted as I understand them, is, to me, the more interesting thing. And this is that babies have obvious bodily/movement responses to surprises. Yes, “surprise” is the word Gazzaniga uses to describe it. Also in a figure³²⁵ that Gazzaniga offers, a thought bubble containing an exclamation mark and a question mark (!?) graphically shows the infant’s surprise.

Comment [SG91]: I deal with this elsewhere and need to avoid the repetition of this example.

I am much influenced by Peirce’s understanding of abduction or hypothetic inference as I have written about extensively above. Abduction, Peirce said, is a “feeling kind of knowing.”³²⁶ It is the rise of belief, of hypothesis, of a kind of knowing that isn’t yet established by conscious rational process of inductive or deductive reasoning, by the objective application of data; but it is the kind of knowledge that is most fully felt.³²⁷ Peirce referred to it as a “best guess.” Diane Ackerman wrote, “We’re devotees of the hunch, estimate, and best guess.”³²⁸ It is why we constantly ask “why?” It is the kind of knowing that can, using other inferential methods, be extended in useful ways to the world around us. It is the knowing that grounds us, drives us, impassions us, and that, because it is felt, experienced in our bodies, is inseparable from emotion, motion, and life. We see in the expression of surprise on infant faces the birth of this distinctive human trait.³²⁹

So while Gazzaniga is more interested in documenting that infants come prepackaged with certain kinds of knowledge expectation, I am much more impressed that they come prepackaged with abductive capacities which even in infancy show that the feeling responding body is the locus for developing neuronal ensemblings; that even infants are capable of, indeed, come equipped to feel surprised, to inventing a little chicken poop where needed. Surprise and the accompanying feeling kind of knowing ground our creativity, stories, art, ritual, myths, sciences—all these lies that feel like and often are truths. Gazzaniga’s longing for that rare human moment when a primitive belief (I assume this is what I see as the feeling kind of knowing) may be bludgeoned to death by that quintessential human property of mind and reason reminds me of those who commonly identify religion principally with “thought” and thinkers (writers and readers), relegating the rest to some “primitive” or “popular” or “living” belief and practice.

Circling back let me ask some more questions and reflect a bit more on those experiments Gazzaniga performed. In the process in which the subject creates an hypothesis or makes up a story or offers an explanation when the conditions are counter to the broader set of facts is presumably a different process than occurs when a person with the full set of data simply identifies a match. If it were not a different process then I think the results of Gazzaniga’s example must be reconsidered. That is, a person whose right and left

³²⁵ Ibid., Figure 6.2.

³²⁶ Ibid.

³²⁷ Peirce here anticipates the discussion of blending in Fauconier and Turner. See later section “Thought Cognition Creativity”

³²⁸ Ackerman, p. 15.

³²⁹ For an extensive discussion of creation, discovery, hypothetic inference see “Charles Sanders Peirce: Play and the Logic of Discovery,” pp. ??-??.

hemispheres are communicating will describe the selection of the shovel in terms of the apparently logical match to the snow scene. I presume that there must be a different process and sequence of processing that occurs for the person who must deal with the external demand to make coherence of the three images—chicken foot, chicken, and shovel—co-residing in the left brain without connection to the right brain. The first or whole brain problem demands that the person identify and describe the coherence observed which seems somehow presumably natural, at least unquestioned. The point is that when the explanation “cleaning out the chicken shed” is offered, it isn’t accompanied by an awareness of any intentional invention. The second or left brain problem demands that the person state the coherence among these images even though the condition of coherence used by the right hemisphere to make the choice is, in the left hemisphere, initially one of incoherence. Thus the left-brain engages the interpreter (Gazzaniga’s account) or other mechanism to fabricate, seemingly unconsciously, an explanation, a narrative of coherence. Now the problem I have is that there seems to be an assumption that there is some objective and natural connection (correct or right) between chicken and chicken foot and winter snow scene and a shovel. In other words, the experiment seems to be built on the premise that there is an objectively “correct” correlation between the dominant images and only one among the four possible matching images. This presumption seems to me to suggest that coherence is then somehow “natural” or automatic or objective and resides apart from, outside of, the left-brain “interpreter.” The right brain’s selection of the shovel to match the snow scene without the left brain being involved would seem to be evidence of this presumed extra-reasoned basis for the match.

These observations raise a number of issues for me. I’d like to see a much greater range of examples presented to these subjects to explore further this mechanism of identifying coherence. What if the shovel and the chicken head were removed from the choices and the subject was still asked to choose the best match. Are there any ways in which one could choose a lawnmower, or a rake, or a pickaxe, the other possible choices, to match a snow scene? Are there any ways in which an apple or a toaster or a hammer could be selected to match a bird foot? Given the operation of the “interpreter” in the left hemisphere, one would presume that it would not simply be stymied but would rather construct some sort of story, a narrative of coherence, to explain a selection of any one of these three choices. The question is then would the right brain, which presumably does not have an interpreter, be simply stymied? I’d guess some choice would still be made. If this guess is correct, then it would suggest that anything can be made coherent by becoming part of a story. This reminds me of a bedtime game I used to play with my granddaughter. Either of us would name a group of random items of any sort; a list of random words. Then the other had to tell a story that interwove into it all of these items. We could always do it and the results were often fun and delightful.

Another layer of this problem is how would we state the principle of these choices or explanation of coherence? Seems that the foot of a fowl (which Gazzaniga interestingly continues to insist on naming with the term “claw”) is paired with the rooster head (which interestingly Gazzaniga insists on calling a “chicken”). Seems the principle of coherence is that two potential parts of the body cohere because of the unity of a body. In the second match a snowy winter scene is matched with a shovel (which doesn’t necessarily look much like a “snow shovel”) on a different principle of coherence, namely, that a shovel is a

Comment [SG92]: Check the pictures. Rooster has wattle chickens don’t

tool commonly used to remove snow, even though there appears no urgency in the scene that snow need be removed. The principle of coherence for left side images seems to me to be a looser connection than the right side principle thus requiring a greater degree of interpretation. What is intriguing to me about this is that this looser connection was presented to the right hemisphere that apparently does not have an “interpreter” or a means of communicating explanation. How much looser an association would be possible for the right hemisphere to “silently” still be able to make the choice? It must quickly be noted here that these comparative matching processes engage conceptual blendings as I have discussed above in various terms.

The second issue that is raised by these concerns is the matter of coherence. It seems to me that coherence is assumed in this experiment to be a condition of objective reality and can be simply taken for granted. To understand these processes more fully we need to try to understand coherence more fully. It would seem that Gazzaniga’s experiments would suggest that coherence is both a product of the process of the interpreter, that is in offering explanation for selecting the shovel to clean out the chicken shed, and also a product of some process that operates outside of the interpreter, since the shovel was selected because of some evaluation of coherence and degrees of coherence by the interpreter-less right brain. Clearly the issue of coherence must be much more fully and rigorously explored. I believe that a strong case can be made for holding that coherence is not logically based or resides as a property of objective reality.

Following Peirce and Gazzaniga (at least the implications of his research on infants) coherence is not the product of some logical interpretive operation, but rather is the product of processes initiated by the feeling of surprise, the feeling of incoherence. Incoherence then is necessarily paired with coherence. Both are distinguished by feeling qualities. The copresence of coherence/incoherence fuels hypothetic inference, the drive to know.

Story can be understood as a narrative of coherence experienced as such because of the constant imminence of incoherence. Story implies a whole, an end, a narrative line, a sequence of related events. Yet story also implies drama, narrative tension, conflict, suspense, elements of the unexpected and an unknown conclusion. The engagement of story is the copresence of coherence and incoherence; a metastability that generates narrative movement. A listener or reader is driven to continue on because of this very copresence. Even knowing the outcome (and, after all, most religious and even literary stories are “old stories”) doesn’t diminish the incentive to move through the narrative. We might appreciate this narrative force as inseparable from the experiential (feeling) component of the narrative tension. Story as movement can also be appreciated more fully in terms of the force associated with the copresence of the story narrative and the listener/reader. As movement occurs only in the copresence of here and there, self and other, story occurs only to be told and thus heard/read. As modern narrative and literary theory has shown, the story exists only in this relationship and it is necessarily a relationship of movement by the very nature of narrative. It is whole and complete, as it is also comprised of the movement of the narrative.

We might also consider that one of the important contributions of talk psychotherapy is to provide a patient with a narrative of coherence, a story that allows the experience of incoherence to nonetheless become a contribution to vitality.

The implications of these reflections are significant and illuminate some important aspects of this whole biological process that are not discussed by Gazzaniga, one would presume because he is focused on the central nervous system (the brain in the skull and emphasizes the locational specialization) and with his special investment in the importance of the “interpreter.” Coordination dynamics offers an important alternative to the assumption of an “interpreter” in the brain. The implications are that all mental processes of seeming reason (as performed by the interpreter) or hypothetic inference or story-making are initiated and motivated by feeling types of knowing, the feeling of surprise or incoherence or incongruity. Our lives unfold energized by the pursuit of coherence in the constant presence of incoherence. The core of neurological coordination dynamics is to recognize patterns, interconnect patterns, recall memory, correlate concept with experience to attain momentary and passing feelings of coherence in the ever presence of incoherence.

These are a few notes on the consideration of “coherence;” it is but a start and much more need be done. Yet, even this much reflection can provide new insight in returning to Jonathan Smith’s important discussion of difference and incongruity as the foundational basis for comparison as “the” method for the academic study of religion, as the fundamental operation of knowing and perceiving. Building on Paul Ricoeur, Smith often uses the statement “incongruity gives rise to thought” or we might rephrase this as “incoherence gives rise to thought.” Unpacking this statement a bit, it appears to say that thought (Gazzaniga’s “interpreter”?) does not occur other than as the result of incongruity or incoherence which, since thought has yet to arise, is then apparently not logical or interpreted. Of course, I don’t think Smith or Ricoeur really meant all mental activity, but rather the conscious problem-attending kind of thinking. What conditions can there possibly be other than felt conditions or interoceptive perceptions? It would appear then that thought (intentional thinking) takes place in the brain, but processes involving the entire biological organism and influenced by nonlinearity always motivate and influence and monitor it. These processes coincide with the basic philosophy of movement that I’ve been using to guide the progress of this book. Movement is process conjoining a here and there, copresent in movement yet divided by a virtual distance; a negative in Barbaras’s analysis. Self-movement, Barbaras’s living movement, is the process conjoining self and other (environment), copresent in movement yet divided by a virtual distance. Incongruity, incoherence, correlates with the distance, the divide, the gap (understood as a negative) but that is necessary for the movement in pursuit of (Barbaras’s term is desire) coherence, congruity. Some forms of such pursuits include intentional problem-solving kinds of thought, but only some. All are fuelled by the interplay of incoherence/coherence.

Coherence

Coherence, understood as a feeling aspect of copresence, is much more satisfying and interesting I believe than meaning or resolution. An account of coherence, as I have hopefully begun to outline, must understand coherence not in logical or rational terms but in feeling terms. Coherence is a quality of feeling occurring when certain dynamics arise in

the ongoing process of coordination. Coherence is achieved momentarily in the process of attempting to dissipate the incoherence that is accompanied by feelings of surprise or incongruity or incredulity. Coherence is always inseparable from the persistent threat of incoherence; this threat is the ongoing basis for the desire for and the quality of feeling of coherence. There is a quality of poignancy to the feeling of coherence since the threat of incoherence looms nearby. Coherence, the drive or desire to win the feeling quality of coherence, gives direction to the ongoing process of living. Coherence is a framework for understanding self-movement. Coherence can be appreciated best in terms of the copresent implications of self-movement. To comprehend the experiential qualia of feeling recognized as coherence, I suggest that there are correlations of these feelings of coherence with the feelings of smooth self-movement.

9 Fat Present

“If the future is already in some way contained in the present, which also contains the past, what is the meaning of an arrow of time? The arrow of time is a manifestation of the fact that the future is not given, that, as the French poet Paul Valéry emphasized, ‘time is construction.’”

Prigogine and Stengers (1984, p. 16)

as quoted in Thelen and Smith, p. 45.

Comment [SG93]: Get orig ref

There is a creative tension, an implication of copresence, with regard to time and experience. This tension takes shape around the experiential present as separate from yet contributing to the accumulation of experience. In some philosophical and scientific perspectives the present is but the virtual line where the past and future meet; the present has no duration; it is a point in time of zero dimension. Yet, were this the case then wherein is the time of experience (and the time of the experience of time, the feeling of time passing), the time in which we feel ourselves moving, the duration that allows accumulation, the present of copresence, the time that allows coordination to be dynamic? In terms of experience, how can the present be absent? As I have reflected on these concerns I have come to believe that we need to reverse the understanding of time from being the virtual meeting of the past which is no more and the future which is not yet to something richer and more interesting; to a *fat present*. I argue that all time, in our sense of it, is in the present, yet this present has duration however brief in terms of objective measures of time. We live wholly in a fat present into which is folded (and thus has space implications) all time, past and future, as accessible neuronal groupings ever available to the current processing into ensemblings that occurs in the present that has duration where, within this micro timeframe, the linearity of time does not have sovereignty. Experience in the fat present then resounds, folds, interacts, is copresent in metastabilities, influences interactively all the parallel endeavors producing nonlinearities. As the grounding for causal laws we construct an understanding of time with its linearity sovereign and this notion works well when retrograded into principles and laws. Experience however occurs only in the unpredictable, nonlinear, metastable dimension of the fat present where such linearity is not sovereign.

In experiential terms this fat present is the where and when, the spacetime, of our now experience, both as the feeling of self-moving and as the vast parallel and reentrant processing that allows us the feeling of vitality. It is also in this fat present that we can compare and be aware and edit and be purposeful, or be what some call “mindful” (a term about which I have obvious concerns). It is in the fat present that the fullness of past and future reside as skill and memory and plan and desire and hope. Certainly we can say that memory and history have physical presence beyond our experience of the fat present in books and in synaptic criteria that await activation to produce neuronal groups. Yet it is difficult to comprehend how there can be any experiential presence other than in a fat present, the only present where such inactive residues are activated in vital enfolding reentrant resounding processes. The fat present is felt vitality.

The demonstration and establishment of the fat present need not rely on some artificial highly abstract argument. Indeed, throughout this book I have presented both biological

evidence as well as biologically based images that establish this fat present. In this chapter, I want to review and extend a number of these ideas. I begin this journey by discussing a fascinating, often infuriating, scientific procedure conducted by the late physicist Benjamin Libet that he believed had relevance to the issue of free will. I find it interesting that this procedure has been the topic of considerable discussion; I also find it remarkable that free will has become a common topic of discussion for neuroscientists. In the midst of this discussion I find echoing the theme of resonance and tonus that has been frequently mentioned in this book. In his discussion of Libet, Brian Massumi introduces the image of “resounding vessel” which I think is a provocative descriptor of the dynamics of animate organisms. Certainly the biological dynamics of tonus reverberate with the philosophical exploration of “resonating vessel” to provide ways of richly comprehending this notion of fat present. In autobiographical terms, this sequence of exploration also addresses that thorny issue that I have often mentioned related to the relative slowness and wide variability of neurotransmission speeds. In practical terms, that is, in terms that address our common experience as well as the persistent confounding issues of explanation, I find that groping towards a fat present to be energizing and vitalizing. So I’ll begin with a review of Libet’s procedure that has raises an odd confounding condition unfolding in but a half second.

Mysterious Half Second

Benjamin Libet, the late pioneering scientist in human consciousness at the University of California, published a paper in 1999 titled “Do We Have Free Will?”³³⁰ Libet’s question about free will is based in a controlled laboratory procedure he developed; it has been commonly replicated.³³¹ Subjects are monitored to detect electrical changes in their brains. They are told that they may “flick or flex” their wrists whenever they choose to do so. They are asked to look at a large clock that has a dot moving around the perimeter and report the location of the dot at the time they are aware of their intention to flick their wrist. The monitor of the electrical activity in the brain indicates the beginning of neural activity ultimately resulting in the physical wrist movement. Thus there are three identifiable moments in time: the initial activation in the brain, the subjects reported time of their intention to act, and finally the physical movement of the wrist. One might expect that the intention would come first followed by the ramping up of the brain initiating the sequence of neuromuscular processes ultimately resulting in physical movement. Such a sequence would follow the will, intention, action sequence that is a baseline expectation of human agency or in broad philosophical terms free will. However, Libet’s laboratory results invariably produced these confounding results:

Electrical change in brain activity or readiness potential	(clock = 000.0 msec)
Awareness of intention to act	(clock = 350.0 msec)
Motor act	(clock = 550.0 msec)

Here is how Libet abstracted his article:

³³⁰ (*Journal of Consciousness Studies*) details. Also list his other related publications avail in Tse’s book.

³³¹ Youtube vid that shows it.

I have taken an experimental approach to this question. Freely voluntary acts are preceded by a specific electrical change in the brain (the 'readiness potential', RP) that begins 550 ms before the act. Human subjects became aware of intention to act 350–400 ms after RP starts, but 200 ms. before the motor act. The volitional process is therefore initiated unconsciously. But the conscious function could still control the outcome; it can veto the act. Free will is therefore not excluded. These findings put constraints on views of how free will may operate; it would not initiate a voluntary act but it could control performance of the act. The findings also affect views of guilt and responsibility.³³²

The surprising result that, for Libet, raises the question of free will is that the evidence of his study shows that the brain initiates action a third of a second before the subject thinks she exerts, or is aware of, the intention to act and a full half-second before the action occurs; thus there exists this mysterious half second. He writes, "The initiation of the freely voluntary act appears to begin in the brain unconsciously, well before the person consciously knows he wants to act. Is there, then, any role for conscious will in the performance of a voluntary act?"³³³ He argues that free will can act only during the final 200 msec of this sequence and that since the readiness potential is already engaged to initiate the motor act, the only possibility for free will is to suppress what the brain has unconsciously initiated.

According to Peter U. Tse, in his *Neural Basis of Free Will* (2013), "many scientists and philosophers have used Libet to argue against free will and responsibility."³³⁴ Libet's reflections on the issue of "free will" based on implications associated with a "mysterious half second" have drawn consideration from cognitive scientists such as Shaun Gallagher in *How the Body Shapes the Mind* (2005) and philosopher Brian Massumi in his *Parables for the Virtual* (2002) and neuroscientist Peter Tse's entire volume is on the issue and he deals with Libet extensively.³³⁵ I would think theologians, philosophers of religion, and even students of religion might be interested, but I have not found any.

I have to say at the outset that there are many things about Libet's approach not the least of which are his conclusions, which I'll quote in a moment, that I find simply silly,³³⁶ all due respect to Libet, and I'll outline several of these below.³³⁷ Yet, I do believe that the research

³³² Libet, ???, ??

³³³ Libet 1999: 51

³³⁴ Tse, 169 [check quotation] See Tse's critique of the eagerness of neuroscientists to dismiss free will. Pp. 179-80. Also neuroscientist that is on Radio Lab "Blame" doesn't think we have free will.

³³⁵ See especially Tse, Chapter 9 "???"

³³⁶ Oddly, my choice of this word, my certainty that some will be offended by it, my persistence in the honesty of it, my finally not caring about those that will be offended, seem all somehow to me evidence of freedom.

³³⁷ I have to comment a bit on my discomfort in writing these sorts of harshly critical remarks about respected scientists like Libet. First, I must say that I find it invaluable to be aware of, even if I don't entirely understand the technical details, of laboratory based scientific studies and I read many of them and I read discussions of many more. However,

findings raise important issues that lead me to what I think is engaging and creative work. Further, the critical examination of Libet's assumptions and argument lead to revealing and important insights as well. Further, as these issues unfold in the context of the considerations of this study of the senses, of human perception, based on biology and reconstructed in light of the foundational importance of moving/touching, the consideration of this "mysterious half second" at this point allows me to discover other insights about perception, human creativity (including, if we must, free will), and moving (duration) that I, at least, believe are remarkably important and have extensive implications. This endeavor is also built on the congruencies among philosophy and biology; for me, an approach of major importance and potential.

First, Libet's conclusion:

My conclusion about free will, one genuinely free in the non-determined sense, is then that its existence is at least as good, if not a better, scientific option than is its denial by determinist theory. Given the speculative nature of both determinist and non-determinist theories, why not adopt the view that we do have free will (until some real contradictory evidence may appear, if it ever does). Such a view would at least allow us to proceed in a way that accepts and accommodates our own deep feeling that we do have free will. We would not need to view ourselves as machines that act in a manner completely controlled by the known physical laws.³³⁸

Well yes, Dr. Libet, I'd prefer that we not be pushed to view ourselves as machines, although to consider our bodies essentially machines has been the majority view since Descartes, yet does your conclusion not ignore the implications of your laboratory findings? And among the important things I must take up a bit later is your acknowledgement that your conclusion is based on "deep feeling that we do have free will" which trumps the scientific findings. Feeling, even in this scientific context, plays a central role as I have already discussed. I'm fascinated that Libet seems unable to abide by his own findings because these findings are in tension with his own "deep feelings."

But I can't resist exploring a bit of the silliness (to me) not to denigrate Libet but rather to foreshadow my later constructions. Let me just tick off several unaddressed concerns that seem rather obvious:

- If we were electronic machines, as I have explored before, the whole half-second business would disappear, mystery resolved. The electronic and mechanical nature of

in reading them I am often struck by what seems to me a disconnect between the demand for remarkable control and precision in procedure and usually also in the analysis of the findings and the broader contextualization of the premises of the study. For most of these studies there are extensive mathematical renderings and arithmetic calculation in exacting precision. However I find that many of these studies make much connection with the broader assumptions and implications of the context that largely determines their study. I see this as an aspect of the Humpty Principle and I am certainly not the only one to make frequent reference to this strange disconnect.

³³⁸ Libet, (pp. 56-7). Surely the disconnect I refer to is patently obvious in this statement of conclusion.

machines operates at a virtually instant response, so this half-second would simply vanish; intention, initiation of process, and action would coincide. While we are not considered to be machines by Libet (and interestingly he seems not to want us to be machines), his understanding of time and his explanation depend on a correlate assumption that renders us machines or like machines nonetheless. By laying this process out in a strictly linear fashion and expecting that actions occur only at precise instants that correlate with points on this spatial linear scale, he basically renders us as machines, rather than animate organisms, thus to a significant degree creating the issue that he then finds needing explanation (an aspect of what I refer to as the Humpty Principle).

- Identifying the final 200 msec as the place where free will might continue to exist and then only to *suppress* the motor movement already initiated by the brain is of little comfort. I spent a bit of time trying the following simple experiment (and I had my students try it as well). Sit down, initiate a wrist flicking movement, then upon becoming aware of the intention to move immediately use free will (if you choose?) to stop one's wrist from flicking. Try it! The results are interesting (my students just sat there and looked at me with weird expressions) because any success at stopping my movement was really to find that I'd pretty much cheated by planning ahead to not move and then only have a faux awareness of a faux initiation of a faux movement with an actual stupid smile on my face. This little experiment not only confirms what Gallagher says (see below) that free will doesn't belong in 200 msec, but it also demonstrates that if this is all we get for free will I can do without it thank you very much—too deceitful. This limited role of suppression for free will confined to 200 msec doesn't make sense even in Libet's own data. Suppression of a decision would necessarily be of an entirely different order than decision to act. I can't see how these can differ. A decision to avoid flicking would, it seems to me, necessarily be preceded, just like the decision to flick, by brain activity by that 350 msec amount, yet there are only 200 msec before the actual flick occurs, so suppression in this scenario would be impossible or it would have to coincide with the initiation of RP. Further we'd have to understand free will in something like these impossibly schizophrenic terms: free will is my ability to freely and intentionally suppress what my brain decides that I should do.
- I think that had Libet included a test of this "free will" suppression in his study it would have revealed that there would have been an unconscious ramping up of brain activity associated with the suppression that expressed the "freedom" of will left over. This would have added a complexity to his analysis that likely would have made even the scant residue of freedom he tries to retain impossible. A bummer for him, yet consistent with his findings.
- Libet doesn't seem to take into account neurotransmission speeds (reaction speeds) at all. For example what of the time it takes to move from awareness of intention to observation of position on a clock to the identification of that location? I suppose that he is assuming that vision is instant in terms of identifying the clock location, but then is the awareness of the location instantaneous as well? Again in this respect he assumes we are machines.
- Libet also does not ask his subjects if they have an awareness of readiness potential. I suspect the subjects most likely would; in fact, how could they not? What I'm referring to here is that the subjects are not simply sitting idle with nothing on their minds and

that the intention and the awareness of intention comes raw out of nothing (I'll discuss this in a moment related to reaction times in gun fights). Rather, these subjects are told that they must flick a wrist and that to note when the decision to move had been made. Yet, what these subjects were all doing was a complex process of building the tonus, the readiness, to make a decision. And not only to make a decision, but to also have a readiness to observe a point on a clock where they make the decision. Surely decision or intention is part of a process, not confined to the instant moment of initiation. Surely decision and intention are complex comparative parallel processings. Because of relatively slow neurotransmission speeds, such a process takes time, at least if you are human. One might then suggest that the will to decide when to move is outside of this whole timeframe or, at the least, is running parallel to it. This absence of the openness to parallel processings, reentrance, degeneracy, coordination dynamics, is I think a major limitation on these studies particularly given that all of these ideas were well known to neuroscience long before these studies were conducted.

- When we press these issues we begin to question what is actually being measured and marked by these studies. Peter Tse puts it well when he notes that it is "still unclear whether the readiness potential is a neural correlate of the motor act, the planning of the motor act, expectation of a motor act, or of conscious willing."³³⁹ Or, I might add, all three. Tse has similar concerns about what exactly the time designation on the clock references: "the conscious feeling of being about to move? Of intending to move? Of having urge or desire to move? Feeling that an imminent motion is agentially authored? Is it a conscious content that is prospectively causal of the subsequent motion? Or is it only retrospectively causal of motion?"³⁴⁰ When I imagine myself as a participant in the study, I imagine myself sitting there constantly thinking about intention and causation. To me it feels like a rather thick fog and frankly I rather think that my awareness of intention might actually be rather arbitrary, a kind of surprise, that I wouldn't even expect to correlate very well with movement or decision if held to the measurant in linear time. For me this foggyiness is the feeling of complex parallel reentrant nonlinear processings that I'm attempting to focus on all the while knowing that chance and nonlinearity will somehow energize an attractor enough to finally cause my wrist to move. I'm more aware of the fog, that is, that this is a vague nonlinear process of complex simultaneity, rather than some simple linear sequenced events.
- Now to follow Libet in his project, he says that the brain initiates the movement before we are aware of it; the brain is then a silent independent initiator. Many of the currently popular brain studies tend to focus on similar presumptions; and proclaim success by discovering the brain areas that are making our decisions for us.³⁴¹ This approach separates "my" brain from being "me" and it also posits that it has the possibility of initiating a coordinated function without the awareness of the person in whose body the brain resides. This seems to mean that my brain has a mind of its own, unconscious to me. What? So, this means that the brain is capable of secretly getting a whole bunch of its neurons together to task to the same purpose and it does so on its

Comment [SG94]: Do this here ... I can't find who told this now? Hmmm.

Comment [SG95]: Look up some of these examples.

³³⁹ Tse, 170.

³⁴⁰ Tse, 175 [check accuracy of quote]

³⁴¹ Perhaps some eggs of these: Gazzaniga's ???, Patricia Churchill's determinist view, others.

own initiative and keeping its little tricky actions from “me,” but then (later I presume) allowing me a false sense that I made a decision so that I’d be fooled into thinking I have free will. My brain has free will, but I do not! How can this make any sense? What mechanism, or will for that matter, coordinates this organized action? And if this has been a task that has been given by someone external to the person whose body the brain resides in, how does the brain gain the initiative for the task independent of that person? Is my brain spying on me or what? And who is this initiator of the motor act if it isn’t me, some mystical alien? On this point, to take Libet seriously one would have to posit that our brains are quite literally under the control of an alien; an alien, we would suppose who has “free will” and maybe even my free will (I want it back!).

- A fascinating and quite significant implication of this notion “that my brain made me do it” is that apparently there is a remarkable increase in using this very argument as a defense strategy in courts of law.³⁴² Libet indicated that his findings would have impact on our sense of responsibility. It apparently can be convincing to judges and juries that one can claim that because of a defect in one’s brain, one couldn’t help but commit a criminal act. I’m guessing that such an argument is made almost exclusively to distance oneself from responsibility for illegal or criminal actions and never for laudable or exceptional actions. Consider the complement: “Give the award to my brain because it has a special malformation!” And should this separation of “me and my brain” be convincing then a judge might suggest that the brain be incarcerated for the crime and leaving it to the free will response of one manipulated by the brain whether or not to accompany it to prison.
- Another way to consider these results is that “free will” is confined to our unconscious functioning, but then how can it be will or intention? Libet seems to simply separate the conscious from the unconscious as being of two separate minds or domains or states; I’ve strongly argued against such a simplistic separation. Indeed, in studies of consciousness I often find that there is an either/or assumption, either one is conscious or not. It is my sense, as I have said, that there is a continuum on which both consciousness and unconsciousness blend and interact. Clearly much of our neurobiology functions autonomically (breathing, heart beating, etc.) and we are fine with this. It is only with the process of intentional voluntary action that gives rise to the issue.
- Finally, to see a motor act as a one-way simple sequence from brain activity to motor act may be a popular notion (actually we see it in popular press all the time; even in scientific literature, yet recall that I have already pointed out the questionability of these methods), but surely we must understand that any self-initiated physical movement involves an enormous amount of proprioceptive/brain interaction, a chaos of reentrant dynamic coordination, to simply build up (in the actual terms of synaptic criteria³⁴³) to the initiation of the actual movement. And, as I’ll show, below, this fills the half second but not in some linear timespace sequence, but in a massive circulating

³⁴² Get details of studies, etc in Radio Lab “Blame” podcast.

³⁴³ Tse focuses on these synaptic criteria and how they change under the influence of experience as at the core of our freedom of intention. I think synaptic criteria are unbelievably important to the entire functioning of neurobiology.

resonating process creating eddying pools in which linear (causal sequenced) time is not sovereign.

Before I consider this example further, Brian Massumi reports another similar scientific procedure. “Mild electric pulses were administered to the [cortical implanted] electrode and also to points on the skin. In either case, the stimulation was felt only if it lasted more than half a second: half a second, the minimum perceivable lapse. If the cortical electrode was fired a half second before the skin was stimulated, the patients reported feeling the skin pulse first.”³⁴⁴ So here again is this mysterious half-second and now it is indicating something very strange. I’m not so sure I understand exactly how a “patient” feels a pulse to the cortex or identifies the location of the pulse (I don’t think the cortex has feeling/sensory receptors), but it appears that in reporting the skin stimulation before the skin was actually stimulated, there was what researchers, according to Massumi, call “a backward referral in time.” What? The action runs against the vector of time? But this observation too is highly important to where I want us to venture, because it indicates that empirical linear causal time progression simply isn’t sovereign in some areas of our biology and experience; a position that I’ll firmly support as we continue on.

Philosopher Shaun Gallagher in his 2005 book *How the Body Shapes the Mind* also responds to Libet’s findings. Gallagher seems clearly to want to support “free will” and his argument is based on two propositions: first, that “free will cannot be squeezed into 150-350 msec” and, second, “that the notion of free will does not apply to abstract motor processes that make up intentional actions—rather it applies to intentional actions themselves.”³⁴⁵ This appears to be consistent with the sorts of issues I raised with Libet’s procedure. Gallagher’s analysis opens to the role of body (as demanded, of course, by the title of his book) which he sees connected with the brain in a looping fashion, similar to the way I have described the neurobiological network, yet I have persisted in de-emphasizing the significance of the distinction between brain and body (a distinction fundamental, it seems, to Gallagher). Within this loop, Gallagher acknowledges, actions can be intentional (thus evidence of free will) even if “significant aspects of this production took place non-consciously.”³⁴⁶ Yet, as I have suggested above, there surely is consciousness in some sense with regard to engaging the process that leads to a decision/intention to move; a consciousness of activated tonus. For Gallagher it is important not to restrict the consideration of free will or conscious volition to a subset of motor processes, those as he said that are “intentional actions themselves.” I completely agree based on the silliness that results when one does so. He continues, “voluntary actions are not about neurons, muscles, body parts, or even movement—all of which play some part non-consciously—but all such processes are carried along by my decision, that is, by my intentional action.”³⁴⁷ So Gallagher is suggesting, if I’m following him, that things are not so simple and linear and single channeled as Libet assumes in his consideration of his own findings. Gallagher’s analysis raises a major question: if voluntary action proceeds from decision, but that decision isn’t about neurons, muscles, body parts or movement, then what is decision about

³⁴⁴ Massumi, *Parables*, 28.

³⁴⁵ Gallagher, ???, (p. 238)

³⁴⁶ Gallagher, ??? 239 check quote

³⁴⁷ Gallagher, ???, 239.

and who is making it? I believe that when we take Gallagher seriously, we find ourselves back at positing an “alien decision maker” that isn’t me. Here is how Gallagher describes the more complex process:

In this complex interaction conscious decision-making—the taking up of intentions—the interpretations of what we experience—can shift the system and alter the biases, can create new biases that in the long run add up to ‘character’—which in turn may determine future responses. So, what is ‘in the loop’ is not just the non-conscious processes happening in our brain, but the larger system of body-environment-intersubjectivity. Dennet is right to say that you are not out of the loop. But the loop isn’t just you. It’s larger than you. It’s you as you interact with the things and with other people in the world. And it is only in those larger contexts that the issue of free will is at stake.³⁴⁸

Gallagher describes in general terms a looping interactive self-adjusting process that is constantly ongoing and being modified throughout life; in other words, what in my terms, experiential neuronal ensemblings. Gallagher leaps out of the biological framework when he refers to this accumulation of experience in terms of “character,” but he at least adds this larger timeframe that includes accumulation. Tse’s studies give content to Gallagher’s “character” by showing how experience influences synaptic criteria. Thus, it is the whole organism that continually modifies itself so that nonlinear processes have enormous freedom. Gallagher understands Libet’s half second as but a snippet in the much larger domain of the entire human being in the context of her entire history of experience involving her own body, her interactions with the environment and with other people. And at that Gallagher doesn’t see a simple linear cause and effect relationship unfolding in a half second as of any value apart from the entire system and the impact of all of its experiences. The important contribution Gallagher makes, for me, particularly when supported by the work of Tse, is to acknowledge the complexity of decision-making, of intention, of freedom and he hints that this is a looping (thus reentrant and nonlinear) rather than a linear system operating simultaneously at both conscious and unconscious levels. Gallagher seems to dismiss then the mysterious half second as a product of considering the processes of intention and action framed as simple linear cause effect when it should be framed as a looping self-adjusting dynamic network. In other words the mysterious half second is an artifact of a simplistic retrograde accounting. While I concur, I think there may be some value in holding on to this mysterious half second a bit longer.

I’ve been thinking of something with which we all have experience that might help us grasp a bit better the implications of Gallagher’s observations—those word problems we all had in grammar school math classes. Something like this: Frank went to visit his cousin Sally. He lives 100 miles from where Sally lives. If Frank drives at 50 miles per hour and leaves home at 4 p.m. what time will he arrive at Sally’s house? Now a diligent grammar school student will quickly do the math and proudly proclaim that Frank will arrive at 6 p.m. Doubtless his teacher will smile broadly in approval (star stickers and smiley faces). However, a student who has an uncle Frank who has a cousin named Sally and based on experience knows something of Frank’s “character” (recall this is Gallagher’s term) might

³⁴⁸ Gallagher, ???, 243.

answer something more like “perhaps around midnight.” While this student undoubtedly would fail the math quiz and earn but glowers from his teacher (frowny faces), he would be allowing the Frank in the problem the freedom of will that his own uncle might surely exercise while on the way to visit his cousin Sally. This student might know that Uncle Frank will most certainly drive past a favorite bar along this route and that he should arrive there around 5 p.m. just in time for the start of happy hour. This student might know that his Uncle Frank would most likely meet a number of friends there so that he would spend the entire happy hour drinking and socializing. By the end of happy hour the group would most likely decide to move on to their favorite restaurant for dinner and after dinner they all love to play pool and enjoy more drinks. Knowing his uncle he might figure that by around 10 p.m. he would remember that he was actually on his way to Aunt Sally’s house, but that it would take at least another hour before he would feel sufficiently guilty and get adequately sober to drive the last hour to her house, thus arriving around midnight.

Now interestingly the first approach to the problem is easily defensible because the problem is set up at the beginning to eliminate any possibility of novelty, say even a flat tire or a delay at a railroad crossing, the need to stop for gas. It is totally deterministic in some sense. It is quite interesting to me that this kind of problem is given in education for the very reason of offering “real world” applications rather than abstract calculations. Yet, this method conditions us to understand life, rather as did Benjamin Libet, as determined from the outset and not by what happens along the way that includes chance influence in the environment and on what has happened in the past; the approach eliminates all possible unforeseen novelty, chance events, and so on, and totally determines the outcome by how we set up the problem, by how we look at the world or think we are supposed to. Uncle Frank is an “X” and is allowed no “character.” There is not a math class in the world that would accept as correct the second answer I offered to this problem, although we have to ask if this approach were taken to math problems, leaving the moving in the travel including the possibility for novelty and chance and character, we might see the world entirely differently; a world more alive and moving and creative. And our understanding of mathematics might be more interestingly complex and sophisticated.

An important observation is that, as Gallagher indicates, free will (although what we might mean by this is itself always, I would argue, an application of the Humpty Principle) is appropriate to a larger domain; a domain eliminated by a number of the aspects of the way Libet set up his problem. No wonder Libet retains some possibility of intentionality yet does so in the wimpiest and most tenuous way. Despite this discussion of Libet taking on a rather artificial character, we are I think learning much in engaging Libet’s procedure and the discussion it has provoked.

In his *Neural Basis of Free Will* (2013) Peter U. Tse addresses important philosophical questions from the perspective of a neuroscientist. He asks “how can we have any measure of freedom in a world in which physical events mindlessly obey physical laws?”³⁴⁹ The simplicity of this opening question seems far more interesting than the question “Do we have free will?” The later question simply cannot escape the Humpty Principle. We always have, as we saw evident in Libet’s work, deep feelings that predetermine everything we can

³⁴⁹ Tse, p. 2.

ever say or do related to the concern. Tse's framing has a different quality and sensibility to it I think. As our naïve notion of science tells us, the entire history of the universe including the tiny paragraph on humans is a story that can be told in terms of physical laws. This view is inseparable from a mechanistic deterministic lawful universe and it is extraordinarily difficult given the enormous timespace frame of the history of existence to carve out some strange exception for an odd little group of bipedal creatures. Yet surely the very idea of "freedom" cannot arise at all in a totally deterministic lawful universe. This argument, while perhaps of the neglected type remains for me core and fundamental. Because we have such a "precious" idea of freedom; because it has taken on endless romanticized perspectives throughout human history; since the suppression of freedom is a common technique of subjugation and punishment; we cannot but know that something we call freedom does exist; otherwise why would it be so charged? If nothing else it exists because we experience both freedom and its absence. In broad historical sociological religious political economic frames we have constituted ourselves as human beings deeply in terms of freedom. So the question then becomes much more interesting if asked not as "do we have freedom or intention?" but rather as Tse does, "how is freedom possible in a world where we also assume the unchallengeable and unavoidable relevance of physical laws?" I think this is not an either/or issue, a traditional dualism, but it is rather inseparable from the persistent and unfolding concerns developing throughout this book. How can we comprehend that physical law and novelty and freedom are interdependent, copresent, in conflict while required of one another? I'll attempt to offer a variety of ways we can begin to embrace these complex relationalities and celebrate them rather than feel stymied by their nonlinearity.

Tse grounds his consideration in the premise that "neurons function as criterial assessors of their input and are capable of changing the criteria that will make other neurons fire in the future."³⁵⁰ This is a sophisticated notion of how experience is accumulated. The repeated time-locked synapses related to any variety of experiential circumstances change their criteria based on an assessment of the experience at the neuronal level. This is an important part of the neural mechanism of creating and recognizing neural patterns or groups; this is the coordination dynamics operation in ensemblings. The essential role of experience also makes necessary novelty and freedom. It is the context, the environment, the relationality, the history that comprises the essential dynamic of pattern formation and recognition. While Tse acknowledges that experience has been routinely rejected in most scientific studies, it is only experience and the repetitions that accumulate experience that result in the adjusting of synaptic criteria in the formation of functional patterns. His central premise is that "patterns in input can be genuinely causal only if there are physical detectors such as neurons that respond to patterns in input and then change the physical system in which they reside if the criteria for the presence of a pattern in inputs have been met."³⁵¹

Having included experience as essential Tse understands that

³⁵⁰ Tse 2

³⁵¹ Tse, 9

experience is not of events as they are happening now, but of events as they happened in the recent past constructed on the basis of present and past input ... [this] implies that there must be a short-term preconscious perceptual buffer within which past and future inputs are integrated and operated upon before a 'commitment' is made to how past events gave rise to present inputs, which is how they will be experienced. The preconscious buffer permits the influence of stages of form analysis and expectations on the construction of motion paths.³⁵²

Although Tse doesn't identify this temporal buffer with Libet's mysterious half second, it is clear that he understands experience as not confined to the knife-edge "now" conjoining past and future, but rather is a flowing from a short-term, but temporally significant, buffer during which (or in which) extensive complex processes are constructing experience. Some have identified this buffer with working memory; an issue that deserves fuller consideration. These ideas are fascinating and support my extensive discussion of experience and they also support the emerging idea that despite the expected linearity of causation, there exists a tiny but packed buffer that has temporal duration—I call it "fat present"—in which the condition we call variously nonlinearity, freedom, novelty, creativity, is an essential and vitalizing factor. Tse writes further on experience.

Experience is not of the body in some direct, uninterpreted way. Rather experience is constructed on the basis of ambiguous, sparse, and noisy sensory inputs mediated by numerous preconscious operations, such as shape, color and size-constancy operations, heuristics and impliant assumptions about the likely mapping between patterns of sensory activation and the objects and events in the world from which they resumably arise.

What I want suggest is that this looping complex system is actually comprised of many subsystems that are each concerned with different but interrelated matters. One subsystem is involved with groping the world through multiple parallel sensory schemas, another simultaneously is concerned with the sheer muscle movement, while yet another that is separate and parallel and interactive with the first is concerned with reflecting feeling (sensing awareness) that action is occurring, while still another is reflecting on the actions and making evaluations and perhaps adjustments, while still others may be viewing the action as a temporal cause and effect sequence and contemplating the significance of it (intellection), while others are engaging the action with engrams and sensorimotor programs and memories and ideas and images and corporeal concepts. This inter-reticulated multi-segmented parallel and interacting set of processes (our marvelous biology) constitutes a spacetime, a *duration*, rather than a linear sequence of positions. It is inseparable from a *thickness or richness of feeling* unhinged from empirical time; it is a *fat present* loaded up with the simultaneous networkings and regressive recurrent circlings that at least in some domains are aimed at nothing so that they may produce novelty and creativity, while at others are creatively making sense in terms of empirical spacetime of the actions of yet other domains. This *thick viscous fuzzy hazy network of networks* is where we exist, where the world exists to us, where time finds its play, where creativity as well as recurrence are located. In Henri Bergson's terms it is *pure duration* (as I will soon discuss).

Comment [SG96]: Check accuracy of quote

Comment [SG97]: I don't discuss these anywhere in book ...

Comment [SG98]: Do i

³⁵² Tse 193. Check accuracy of quote.

While it is mixing realities in a sense to say this, and I whack everyone who does so unintentionally, I might (primarily for the fun of it) reclaim the mysterious half-second as the interval in linear spacetime that correlates with this wholly nonlinear fat present.

Discussing this mysterious half second Brian Massumi embraces the implications of the “backward referral in time.” Such an understanding of time in this process is essential. Rather than dismissing the backward flow of time as impossible (and note that the very word “backward” presumes that linear scientific time progression prevails as given and perhaps standard) Massumi writes, “that sensation is organized recursively before it is linearized, before it is redirected outwardly to take its part in a conscious chain of actions and reactions. Brain and skin [referring specifically to that procedure of electronic stimulation described above] form a resonating vessel.”³⁵³ Massumi, echoing (and echo is an important term for him) Bergson, glimpses a biological domain of sensation that isn’t bound to linear empirical time, but rather is “organized recursively” before it can be considered in the linear empirical time frame adopted by Libet.³⁵⁴ Recursivity refers to the repeating cycling looping movement. It is the to and fro, afferent and efferent, even of neuroprocessing; Massumi doesn’t explain it in biological terms, yet I have and will continue to do so as an essential counterpart to the establishment of this idea. This behavior with respect to time means that sensation bounces around in what Massumi calls a “resonating vessel” before it is linearized, even enough for it to become a conscious awareness. This resonating vessel is, I think, quite a marvelous image that allows sensation its movement, its potential, its novelty, its creativity, before it is retrograded into some truth (Bergson’s phrase), into some time causal sequence. Explaining further, Massumi writes,

because volition, cognition, and presumably other ‘higher’ functions usually presumed to be in the mind, figured as a mysterious container of mental entities that is somehow separate from body and brain, are present and active in that now not-so-‘raw’ domain. Resonation assumes feedback. ‘Higher functions’ belonging to the realm of qualified form/content in which identified, self-expressive persons interact in conventionalized action-reaction circuits, following a linear time line, are fed back into the realm of intensity and recursive causality. The body doesn’t just absorb pulses or discrete stimulations; it *infolds contexts*, it infolds volitions and cognitions that are nothing if not situated.³⁵⁵

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Massumi, incorporating the wisdom of Bergson (whom he acknowledges) and harmonizing with the sentiment of Gallagher (whom he doesn’t) is adumbrating (Husserl’s notion) a view of human action/intention that involves multiple parallel interacting networked processes that can be separated, but not made independent, and he indicates that only some of these can be comprehended in terms of linear empirical time. Radically understood, Massumi posits that part of the processes of human action and intention are

³⁵³ Massumi, *Parables*, (28-9)

³⁵⁴ However Massumi’s understanding of “before” implies a cause effect linear temporal sequence that surely needs to be avoided. Again, I think there need be a sense of the copresence of these two realities. They are essential to one another yet distinct.

³⁵⁵ Massumi, *Parables*, (29-30)

not subject to the sovereignty of linear cause and effect sequential time, but rather these must be understood in terms of some sort of recursive, infolding, looping, interacting processes that precede, yet parallel, the relevance of linear time. To indicate that this resonating process must precede the retrograde movement of truth may seem a product of intellection where the novelty and creativity is explained as truth and of course it is; that's where this entire project of writing/reflecting is located; yet intellection too is just one kind of biological processing (and an important one, I think). The resonating movement can only be "pointed toward," hinted, adumbrated in this sort of endeavor. Massumi doesn't make enough of his image of *resonating vessel*, akin to Jean-Luc Nancy's "resonating cistern," or make it clearly enough, so I will build on these shortly. The image is indeed remarkable.

Massumi remarks directly on Libet's mysterious missing half second in writing,

the half second is missed not because it is empty, but because it is overfull, in excess of the actually-performed action and of its ascribed meaning. Will and consciousness are *subtractive*. They are *limitative, derived functions* that reduce a complexity too rich to be functionally expressed. It should be noted in particular that during the mysterious half second, what we think of as 'free,' 'higher,' functions, such as volition, are apparently being performed by autonomic, bodily reactions occurring in the brain but outside consciousness, and between brain and finger but prior to action and expression.³⁵⁶

Massumi sees this half-second as overfull, a flood of looping recursive movement. He then indicates that any awareness, any action that is directed toward this movement, must necessarily be *subtractive*; that is, such concepts as "freedom" and "will" are necessarily what he terms "*limitative derived functions*." That is, since such notions are about something else (other than duration), they occur or appear as a retrograde movement of the truth, a derived explanation or conclusion after the fact. I'd emphasize, what I believe (hope) Massumi intends, that even these processes, despite the seeming linear sequence of them, can occur simultaneously, interactively. This is the marvel in a sense, isn't it: that we territorialize at the same time we are feeling, that we backfill and remove and subtract the moving simultaneously with the moving itself and the feeling sensation of moving? Although we must understand "simultaneity" in terms of this "resonating vessel" filled with recurrent infoldings rather than as shared instant. This shift forces us to understand time, including simultaneity, in terms of what I've suggested be appropriately understood as a "fat present" with a thick viscous fuzzy quality of duration.

Zeno catches this kind of simultaneity in his classic paradox of the arrow flight; Henri Bergson sensibly explored the paradox. Massumi follows Bergson reminds us of the implications. Zeno managed in his paradox to collapse the parallel yet interacting systems of movement and the retrograde movement of the true. Bergson pointed out that while the arrow is in flight it is never "in" any point; that is the essence of moving or in Bergson's terms "duration." The analysis of the flight in which the duration has been removed by reducing time and movement to extension or space is a retrograde movement of the true,

³⁵⁶ Massumi, *Parables*, 29

not the moving as duration. The conflation of the two kinds of movement/time gives rise to a paradox or conundrum.

Libet's "free will" problem is on the same order, isn't it? In Libet's problem we analyze the course of action potential that leads both to awareness of intention to move and to the act of movement. The issue of will and freedom are, as Massumi, indicates only relevant to the territorialized or backfilled retrograde movement of the true. In this frame, free will seems doubtful if not impossible or, as allowed by Libet in his conclusion, a gratuitous possible option (that I think actually impossible) confined to a quarter second and functioning only to suppress what it can't initiate. Yet, simultaneous to this backfilling is the resonating vessel of movement that, as Gallagher and Massumi show, is not confined to a simple efferent pathway from brain to extremity in linear time, but rather is a looping self-adjusting reentrant degenerate process encompassing the entire body; but even more than that, it engages the entire history of the body in its interconnection with the environment in which it has lived. [sentence on the synaptic criteria]

Comment [SG100]:

Resounding

The notion of tone or tonus has been regularly mentioned. In some sense it is a readiness potential, the vibrating toned condition of readiness for movement and action. In some sense it is the balancing and vibrating oppositional relationship between opposing forces necessary for movement and action. Muscle groups must be architecturally organized to actively oppose one another in every moving body part in order to enable simple movement. Afferent and efferent information must both be constantly engaged to assure smooth movement. Excitatory and inhibitory tendencies are paired and essential that coordination becomes possible. Everywhere I have located copresence it can be argued that tonus is the vibrating condition of vital presence. The extensive discussion of attractors that underlies coordination dynamics is a discussion of shifting of vibrating or oscillating conditions that lead to tipping points, to the moment of precipitating or initiating action. Tone is oppositional readiness.

Various writers have turned to sound and the properties of sound as fitting and insoundful ways of understanding important aspects of our biology, our living existence. I have already introduced Brain Massumi's development of the idea of resounding vessel to refer to the reentrant looping nonlinear coordination dynamic process essential to animate organic life. "Resounding vessel" is appropriate to the processes I have described in the terms of experiential neuronal ensemblings and indeed the term ensemble I use is also sound-based.

Even as early as the late eighteenth century in his *On the Aesthetic Education of Man* (1793) Friedrich Schiller turned to the analogy of sound and harmonics to discuss the dynamics of copresence. He used the term "concert"³⁵⁷ to describe the situation in which his play drive

³⁵⁷ Schiller's use of the term concert (*konzert* ³⁵⁷ in German) in the late eighteenth century was perhaps consistent with the seventh century French meaning "agreement, accord, harmony," from French *concert* (16c.), from Italian *concerto* "concert, harmony," from *concertare* "bring into agreement," in Latin "to contend, contest, dispute." Again we have this sense of at once "to strive against" twined with "to strive alongside" that perhaps

Speiltrieb originates. Yet, rethinking Schiller's approach it is clear that he understood "drives" that depended on other drives for both their definition and realization. One pair—form and sense—the one, *Sinnestrieb* is bent on existing in the "pure" moment, in "pure sensation," while the other *Formtrieb* seeks form and truth and explanation and law. Schiller's distinction is similar to the distinction of moving itself and retrograde or backfilled movement. Schiller's argument is that neither can exist alone; that each is essential to both the limitations and the realization of the other; in other words they are copresent implication. He put it this way.

We have now been led to the notion of a reciprocal action between two drives, reciprocal action of such a kind that the activity of the one both gives rise to, and sets limits to, the activity of the other, and in which each in itself achieves its highest manifestation precisely by reason of the other being active. . . . That drive, therefore, in which the other drives work in concert . . . the play drive, therefore, would be directed in annulling time within time, reconciling becoming with absolute being and change with identity. . . . The play-drive, in consequence, as the one in which both the others act in concert, will exert on the psyche a moral and physical constraint; it will, therefore, since it annuls all contingency, annul all constraint too, and set man free both physically and morally.³⁵⁸

These various pairings that Schiller considers in each set of three letters comprising the twenty-seven letters of this book, articulate pairings whose two terms function in parallel and interconnection with one another; they are parallel processors that are twined, copresent. Importantly it isn't a balance or an equality or a stasis that Schiller seeks (or reconciliation as was the goal of Kelso and Engström), but an oscillatory vitalizing relationality and further, Schiller posited, that when the two interact in what he termed "concert" this would give rise to a third drive, the play drive. He valued this so highly that he identified it with beauty and freedom. This structurality recalls, or better anticipates, the resounding vessel and cistern and Edelman's musical ensemble as the image of the rise of reentrant coordination dynamics. Schiller anticipates the parallel and necessary parallel processing of experiential present and the retrograde movement of the truth. Schiller's statement on time—annulling time within time—also anticipates what I have been developing as the fat present. The play drive—the oscillating interrelationship between the form and sense drives—rescinds the linear sovereignty of time into a thicker recurrent resounding temporal modality, a fat present.

Gerald Edelman suggested sound and harmonics as valuable in comprehending his view of neuron group formation. He offers an analogy for understanding his concept of reentrance by suggesting that strings tied to the body parts that are moving in the act of their playing,

from different roots—Latin *concentrare* "to sing together" (from *con-* + *cantare* "to sing") as the source in the musical sense—came to be the same word (in German and in English) as musical harmony. The term concert includes the same oppositional or contention of sounds that when alongside one another come into agreement; concert is resounding.

³⁵⁸ Friedrich Schiller, *On the Aesthetic Education of Man* XIV, 1,3.

physically connect members of a musical ensemble with one another.³⁵⁹ He suggests that after but a short time, as the individuals play, the ensemble will begin to develop a coordination or coherence. His intent is to offer a physical model for the reentrant self-coordinating dynamic brain. Unfortunately, this analogy doesn't work all that well for me; I tend to see these musician as puppets, each the master (and the puppet) of the others, screeching away and even breaking strings (musical and connecting) trying to get themselves together.³⁶⁰

For me, I'm happy to keep the musical ensemble idea, but think it better to posit the self-coordination dynamics effected by the interaction of the sound produced by members of an ensemble of musicians, say singers. A nice example of this occurs in the 2004 Swedish film, *As It is In Heaven*, singers "sound" together. And, indeed, I have participated in such an experience and have felt the effect. One person begins by singing or sounding a note and sustaining it. Others join in singing their own notes. Each sustains their sound, or perhaps even something of a musical phrase, for a while and then sounds the same or another note. As the group begins to sing together, the "reentrance" (using Edelman's term) functions so that one listens to the effect of all the others singing as well as one's own contribution to them. It is in hearing all of them and the cumulative effect that one's own voice is drawn into harmony (or perhaps better coherence, because often interesting discordance arises) with the others. This is an example of coordination dynamics creating emerging and dissipating sound ensemblings. The effect is the experience of an unpredictably constantly changing organic whole (ensemblings) and the remarkably complex intercommunication that occurs among all of the individual members' voices. It has no score, no conductor,³⁶¹ and its end occurs only when folks eventually run out of energy or sometimes on rising to some felt shared sense of an ending. Of particular value to the analogy to neurological reentrance is that there is no leader (no master or director) in this ensemble; indeed, in the film *As It is In Heaven* the dramatic high point is when the director can't make it to the group performance because, unbeknownst to them, he is suffering a fatal heart attack.³⁶² A

³⁵⁹ sources for this. I know I've seen it on a YouTube lecture, but he may also use it in his *Second Nature*.

³⁶⁰ However this jerky screechy image I have is useful to me in trying to express what I have difficulty sometimes doing. I have sought images that show what it would be like if the many parallel subsystems that comprise us operated without coordination. Given different processing speeds, lengths of information travel, variables of an almost incomprehensible variety, I have found it a wonder that we don't simply operate in such a jerky way that we tear ourselves apart. Perhaps these musicians tied together with strings, each seeming to be the puppet master of the others, but with no true master, would come to something like this jerky screechy image.

³⁶¹ I read of experiments where large orchestras are set about playing without a conductor and those amazing results that can produce. SOURCE?

³⁶² Interestingly, the choir director is himself a famed musician retired to his hometown because of a severe heart condition. He somehow finds his heart and his love among these village people. A noted moment in the film is when he realizes how vitalizing is this experience and rides his bicycle to some high mountain area. There in exuberance he shouts out and is answered by his own resounding echo.

youth with disabilities initiates the “sounding” when he cries out in expression of his anxiety at the absence of their director. Not only did the choir get involved, but also the entire audience of hundreds soon did as well. Anyone may initiate the “sounding” and it simply goes on until it stops. It is also important to this analogy that the harmony or coherence experienced doesn’t come so much from the efforts of individuals to make some adjustment to their voices to harmonize with the others, but rather that their voices are drawn into sympathetic resonant coherence with the others through the interactions, the physical interactions of the sounds.³⁶³

What I want to focus on is the mechanism of ensemblings, more akin to reverberation or vibration in involving the whole organism in a resounding quality that interconnects and inter-affects the incredibly complex systems that are acting in parallel and even in tension. I believe that this is a matter of biological architecture that engages the lion’s share of neurons, proprioceptors, and other body systems in the tasks of this intra- and inter-system feed forward/feedback reentrant process. Almost all organic processes are concerned with keeping the organism in tune, in skillful readiness for and as self-movement. As I have made clear, I think the neuroscience work that focuses on discovering some specific area of the brain involved in one sort of movement, behavior, or function is important (perhaps more for medical reasons than beyond) yet limited. While it is often proclaimed by neuroscientists that neurons that “fire together wire together,” which is important despite the misleading implications of the analogies used, it is also indicated that something that occurs in one area of the brain tends to have impacts across the entire brain.³⁶⁴ And I believe that similar processes occur throughout the organism; how can they not? It is this later effect of reentrant coordination that I believe is of greater importance in appreciating the biological character of the animate organism. And I believe that beyond neurons, we must also include proprioceptors and hormones.³⁶⁵ The animate organism is possible because of its tonus; it resounds throughout with ensemblings that are constantly refined and supplemented as they are brought to skillfully bear in living use.

All of the quotidian senses have an ordinary and a more active form: seeing and looking, smelling and sniffing, tasting and savoring (which can also apply to smells), touching and palpating or feeling, and hearing and listening. In his 2007 book, *Listening*, French philosopher Jean-Luc Nancy’s whole proposal revolves around “fundamental resonance, even around resonance as a foundation, as a first or last profundity of ‘sense’ itself (or of truth).”³⁶⁶ For Nancy, listening is the tense and attentive mode of hearing requiring a sense of anticipation, an almost there, a cuspishness. In a sense it indicates foreknowledge or the conditions of foreknowledge. Rather than passively hearing; listening is directed and focused and shaped by anticipation and expectation of, if not meaning (which Nancy seems to feel more comfortable invoking than do I), then at least coherence or in the vernacular of

Comment [SG101]: Need to find this in Doidge It is also a point in LeDoux

³⁶³ Much of my book “Into the Future” is a search for a new harmony, a new song, that might guide us anew into a future. See particularly “?????”

³⁶⁴ Doidge, ////

³⁶⁵ I certainly acknowledge that I have little knowledge of the endocrine system but that I feel quite confident that it plays an essential role with principles compatible with those I’m attempting to outline here.

³⁶⁶ Nancy, *Listening*, 6.

sound sonority or resonance. Sound, rather than itself being the meaning or coherence, reveals shape or form or coherence by its resonance, by its response to the vessel it fills or the environs by which its movement and reverberation is shaped. It fills space and time responding to containment and objects encountered by reshaping itself in the effect of it folding back on and harmonizing with itself. Resonators are chambers or oscillators, themselves not sound, but the shapers and enablers of the sonority inseparable from sound. Sound *resounds* and *resonates*, with emphasis on the fold of “re.” Sound resounds only in encounter.

I have made much of the primacy of movement and by this I have focused centrally on human movement, especially the self-movement that is actively proprioceptive folding our movement experience into our bodies in the creation of experiential neuronal ensemblings; sensorimotor programs, corporeal concepts, and memory. But we may begin to appreciate sound and the resounding of sound philosophically as a sort of movement that gets at the very idea of primacy itself, before form. As form and quality emerge from the moving/touching experience of human self-movement, we might think of sonority as the resonance that reveals the potential from which shape can emerge. Since being is inseparable from its transitivity, Nancy asks,

shouldn't truth “itself” as transitivity and incessant transition of coming and going, be listened to rather than seen? But isn't it also the way that it stops being “itself” and identifiable and becomes no longer the naked figure emerging from the cistern but the resonance of that cistern—or, if it were possible to express it thus, the echo of the naked figure in the open depths.³⁶⁷

Here Nancy seems to suggest that the naked figure—that figure before being dressed with distinct attributes of the being that will constitute its transitivity—that emerges from the dark space or a *Ganzfeld* (in the terms I have already considered) does so as from a resonating cistern, a chamber or vessel characterized by sound, for this is the condition of primacy itself. Listening then, in Nancy's account, is not equivalent to seeing the objects that emerge no matter how naked (primal), but of actively attentively anxiously aurally anticipating them as they take shape in a resonating cistern. The consequences of this understanding of resonance are, I believe, stunning.

In the sonorous spirit, let's iterate or oscillate or resonate or listen, maybe re-listen. When we listen for the **echo** that reveals ourselves to us, we can't help but experience that the time of sonority is not the same as the linear regular sequence of virtual points, the knife-edged demarcations of transition, that is common to the linear scientific time, where duration has no measure, indeed no place at all other than as backfilled. Sonority, echo, resound; the sound and the re-sound are copresent as harmonies or disharmonies, heard as coherence or incoherence. Reverberate, resonate, resound, echo explore and reveal the cistern that is primordially, the well from which being emerges. Sound surrounds and penetrates and returns, is without and within, and thus fills space and in the filling of it reveals its character, quality and truth.

Comment [SG102]: Massumi discusses “echo” as does Nancy ... so somewhere make something of this.

³⁶⁷ Nancy, *Listening*, 4.

We can “snap” a picture and indeed the closer we get to a zero interval or exposure, the knife-edge of pure time as linear succession, the more accurate we usually consider the image (Instagram). Such an approach to sound comes up literally empty (consider a song 1/5000th of a second long), void, meaningless, the sound of silence. Nancy put it this way.

Its [sound’s] present is thus not the instant of philosophico-scientific time either, the point of no dimension, the strict negativity in which that mathematical time has always consisted. But sonorous time takes place immediately according to a completely different dimension, which is not that of simple succession (corollary of the negative instant). It is a present in waves on a swell, not in a point on a line; it is time that opens up, that is hollowed out, that is enlarged or ramified, that envelops or separates, that becomes or is turned into a loop, that stretches out or contracts, and so on.

The sonorous present is the result of space-time: it spreads through space, or rather opens a space that is its own, the very spreading out of its resonance, its expansion and its reverberation. This space is immediately omnidirectional and transversate through all spaces: the expansion of sound through obstacles, its property of penetration and ubiquity, has always been noted.³⁶⁸

Nancy describes here a “fat present,” a rich thick opening for an experiential present that opens up and exists as waves on a swell, is hollowed out, is a resounding cistern. While this fat present is of an entirely different order of time than the scientific conception of a succession of points of no dimension it is not that the two kinds of time cannot co-exist. Yet, it is rather clear I think that the concept of time as a succession of points of no dimension is a backfilled abstracted gridified mathematized effort to grasp by notions of lawful succession of dimensionless points (which obviously cannot be experienced) the experiential fat present.

We ought not be surprised, but we might be, to recall that the speeds of sound are slow. Recall the kids’ game of determining the distance of lightening by counting the time lapse between seeing lightening and hearing thunder. One steam engine, two steam engines. In dry air, sound travels at 768 miles per hour, several times faster than the speeds of neurotransmission. But it travels 4.3 times faster in water and 15 times faster in iron, but even then sound is the snail to the cheetah that is light. No wonder thunder rumbles and rolls where lightening flashes; thunder is bouncing around on itself in its media and its spaces. We can feel it strike our ears as it fills our bodies (themselves resounding vessels giving rise and shape to voice); it rumbles inside us as we hear it outside of us and we can also hear it rumble across the land. The very character of sound is its sonority, its resonance, its reaction to its environment and itself and us (both ears and vesseled body). It exists as it fills time and space; not in lines but in bouncing echoes and reverberations folding back time and space on itself in an interference that is revealing to the listening ear and the feeling body.

In the terms of physics variations in speeds and elapsed times of sound are its very character—resonance—and, as Nancy suggests, this sonority characterizes our very

³⁶⁸ Nancy, *Listening*, 13.

capacity to sense, the resonance between perceived and perceiver. Sound resounding sonating resonating is a forgiving openness that allows the differences in times and characteristics to actually constitute coherence; the *resonance* is its sense and the awareness of sensing; resonance is indeed equivalent to the “ing.” It occurs not in the zero time as the integral of our sensual calculus, but rather in a sonorous echoing cistern where time stretches and folds and refuses linear laws as uninteresting. Sound is akin to what Husserl called the “living present,” and what I have grown fond of calling the “fat present.”

With listening revealing the resonating nature of sound as our guide here, we catch a seductive glimpse of an understanding of the perceptual present, the present to human experience, as a “resonating cistern” (Massumi’s “resonating vessel”) a kind of present that is not a zero-dimensioned point in time, but rather an experience of time, thick and rich, that doesn’t strictly abide by the temporal frame of ordinary causality or the strictly linear lock-step sequencing of linear time reckonings. Rather I’ll try to show that our experiential (that is, perceptual) present is akin to a resonating vessel characterized by reverberation, echo, resoundings and diapasons. Nancy again.

Sound has no hidden face, it is all in front, in back, and outside inside, inside-out in relation to the most general logic of presence as appearing . . . to be listening is to be at the same time outside and inside, to be open from without and from within, hence from one to the other and from one in the other.³⁶⁹

The sonorous presence is surely a way to glimpse the copresent implication of movement then isn’t it? It is the implication of the fullness of distance connected by desire as Barbaras describes living movement, or better, moving itself. As sonorous presence is a fat present, a space occupying time-stretching experiential present, at least when reckoned in the frame of our reflection and analysis, it nonetheless moves along in a fashion that obeys the ordinary laws of physics. Yet, this line of virtual or dimensionless presents is not experiential time, not an experiential present, but its existence depends on a backfilled mode of gridifying and reconciling which is itself experienced in its own oddly abstract terms; the fat present that includes grasping a concept. Zeno’s paradox occurs as the outcome of ignoring differences by conflating these different kinds of time. Nancy expresses it this way.

All sonorous presence is thus made of a complex of returns [*renvois*] whose binding is the resonance or “sonance” of sound, an expression that one should hear—hear and listen to—as much from the side of sound itself, or of *its* emission, as from the side of its reception or its listening: it is precisely from one to the other that it “sounds.” Whereas visible or tactile presence occurs in a motionless “at the same time,” sonorous presence is an essentially mobile “at the same time,” vibrating from the come-and-go between the source and the ear, through open space, the presence of presence rather than pure presence. One might say there is a *simultaneity* of the visible and a *contemporaneity* of the audible.³⁷⁰

³⁶⁹ Nancy, *Listening*, 13.

³⁷⁰ Nancy, *Listening*, ??

This presence is thus always within return and encounter. It *returns* (refers) to itself or, better, occurs against itself. It is copresence or “presence in presence;” it is rather in the rebound of “there” or in its setting in motion, which makes it, the sonorous place, a place of a self.³⁷¹

Henri Bergson’s Retrograde Movement

French philosopher Henri Bergson (1849-1941) was influential to many writers that I have already considered and I have presented echoes of his insights. Yet these echoes remain too faint and need resonant amplification, a diapason. In his 1934 book, *The Creative Mind*,³⁷² Bergson’s discussion of time reaches to the early twenty-first century to inform Brian Massumi’s discussion of time, anticipate Renaud Barbaras’s discussion of living movement and also Jean-Luc Nancy’s discussion of time related to his discussion of listening. Bergson makes an important distinction: the essence of time is its flowing; that is, what Bergson calls “real time” is inseparable from its movement, or better, its moving. Time is then *duration* (as Bergson often terms it), change itself, and it is this duration that is what one feels and lives. Bergson holds that we routinely think (and he identifies this “we” extensively with science and intellection) of time in such a way that eliminates duration and flow and movement in order to consider it as a sequence of aligned parts each of which is still there when another part comes along.³⁷³ Time, he says referring to this tendency, is always understood in terms of space, so that time (duration) is understood in spatial terms as extension. Our common understanding of time, he writes, has been set up “precisely to mask duration, either in movement or in change.”³⁷⁴ Intelligence sees movement as a series of positions not as transition so that our action exerts itself conveniently only on fixed points; fixity is what our intelligence seeks. Bergson describes this tendency further in terms of what he calls two “halts:” the halt of mobility and the halt of another mobility that is presumed to be that of time. As I understand Bergson here, we halt the mobility of what we call time by assigning it to points and numbers that align in a space-based sequence; with all the points remaining present to us because we have halted the mobility by this reckoning of it. This halt is then correlated with some other movement and in so doing this other movement too is halted. So, Bergson notes, we seem always to seek only immobility, real or possible.

These comments on time are insightful when we look at Libet’s mysterious half-second. Remember Libet articulated a process of movement that spans a period of time by halting the process (this is what his experimental method is designed to accomplish) tacking it to three timeless instants that can be marked in a frame of scientific linear time: point of beginning of brain activity, point of decision awareness, point of motor action. There is no movement allowed in Libet’s procedure even though there is the appearance that it is all about time and I think Bergson would argue that neither is there time in this study in the sense of its essence, which is flow, duration. Bergson writes, “the essence of duration is its

³⁷¹ Nancy, *Listening*, 16.

³⁷² Bergson, *The Creative Mind* (pub details, 1934)

³⁷³ Bergson, *The Creative Mind*, 10.

³⁷⁴ Bergson, *The Creative Mind*, (14, ck correct quotation)

flow, and that the fixed placed side by side with the fixed will never constitute anything that has duration.”³⁷⁵

The title of Bergson’s chapter on this matter of time is “Retrograde Movement of the True.” In Bergson’s account we are always arguing backwards, a retrograde movement, using a series of moments as a proper representation of time. He writes, “to every true affirmation we attribute thus a retroactive effect; or rather, we impart it to a retrograde movement.”³⁷⁶ Bergson suggests that we assume that the effects observed or experienced are the result of terms that pre-existed the action; but then this assumption robs the action of the nature of its duration, its flow, its changing. The cost of retrograde movement is that everything is predetermined; all can be retrofitted with truth and purpose and intention. Nothing new can ever occur; it is literally unimaginable; or it is simply ignored because it cannot be recognized. The cost paid by taking this retrograde approach is that without movement, without duration, the truth will always emerge as predicted and anticipated (the Humpty Principle); that’s the way we set it up. So for example physics is based on the principle that given the laws that pertain in the present moment the conditions measured at this moment can be projected backward or forward in time to any other point.³⁷⁷ This is the retrograde movement of the true. And in this understanding of time, how is anything novel or unexpected possible? To even raise the question of “free will” is odd because its very possibility has been eliminated by the method of explanation adopted. Anything such as free will is at most limited to some moments of choice within the system.³⁷⁸ And then, as Libet showed, it is only to *suppress* rather than to engender because it comes too late in the sequence of linked causal events to have any other function; and this possibility, as I have shown, is also simply impossible. Free will survives if at all for Libet and actually for science and the intellect because of the unquestioned assumptions about time and movement that eliminate duration and movement only as an inhibitor and at that as a very limited choice leaving the defense of free will, the potential for novelty or even creativity, confined to the weakest of statements hardly worthy of defending. Even then, as with Libet, one suspects that the very discussions of free will that occur in this context enter in lapsed moments when feeling overwhelms.

Bergson holds that because of our habits of halting time we “cannot succeed in conceiving the radically new and unforeseeable.” This is really quite amazing I think and important, particularly if we are interested in creativity and agency, especially if we believe we must

³⁷⁵ Bergson, *The Creative Mind*, (15)

³⁷⁶ Bergson, *The Creative Mind*, (23)

³⁷⁷ The recent discovery of a collapsing star, a supernova, that is “older” than any previously observed is an interesting quite literal example of Bergson’s “retrograde movement of the true.” [look up and give reference for this discovery] That scientists can detect in the present something farther away than any other object known to be so because it has taken longer for evidence of its existence travelling toward us at the speed of light to get here indicates that it is “older” than anything previously observed. Physicists here do provide a literal identity between time and extension in space in order to document more accurately the retrograde movement of the true.

³⁷⁸ Bergson, *The Creative Mind*, (19)

take a “reasoned” approach because it is supposed to trump experience. The consequences are bleak.

Interestingly Bergson doesn’t argue that we should give up the halting view of time entirely, “but we must expand it, make it more supple, adapt to a duration in which novelty is constantly springing forth and evolution is creative.”³⁷⁹ But from where we stand on linear reason isn’t this sort of expansion almost unimaginable? Aren’t we so locked into retrograde affirmations of the true that any expansion or flexing to introduce suppleness would surely be unseen, simply impossible or irrational? I see no alternative but to heed the wisdom of Bergson, yet we must look to him more closely to complement his work on this point and to be inspired by him about how to proceed. We must find a way of vitalizing the gestural halts that define what we retrograders do; I believe this deeply, otherwise why would I be writing this?

First, recalling my earlier discussion, I suggest that humans have amazing capabilities to parallel process; indeed, our human distinctiveness might be meaningfully articulated in our ability to act and react, to feel ourselves acting and reacting, to be aware of the character of this action and influence it through conscious decision, and to intellectually hold our action as subject for reflection and musement; and we can and routinely do all these, and so many more, simultaneously with both separation and interaction among them. Once we acknowledge the complexity of parallel processing, we must take very seriously the necessity and capacities of coordination dynamics that all of these processes might be interrelated enough to function organically, to perform smooth (coherent) movement. So we can at once embrace duration in the terms Bergson suggested—that is, we know it because we feel and live it; indeed, this is the very feeling of living—and we can also simultaneously plot our actions, as objects we can ourselves observe, onto a concept of time that eliminates duration while itself occurring in a milieu of duration, yet provides us with capacities for reflection and even agency. We must and always do, I’d argue, have both, and they (among others) must both exist at once; as copresent.

Later in *The Creative Mind* Bergson offers other provocative images. Consider this passage.

Reality is global and undivided growth, progressive invention, duration; it resembles a gradually expanding rubber balloon assuming at each moment unexpected forms. But our intelligence imagines its origin and evolution as an arrangement and rearrangement of parts which supposedly merely shift from one place to another; in theory therefore, it should be able to foresee any one state of the whole; by positing a definite number of stable elements one has, predetermined, all their possible combinations. That is not all. Reality, as immediately perceived, is fullness constantly swelling out, to which emptiness is unknown.³⁸⁰

Bergson anticipates the very image, the expanding balloon, physicist Stephen Hawking used to posit a solution to the singularity that is inevitable to science and intelligence (Bergson’s term). As Hawking posited it the expanding balloon analogy would allow unity of time without any singular point of origin and without the limitation of a single linear

³⁷⁹ Bergson, *The Creative Mind*, 28

³⁸⁰ Bergson, *The Creative Mind*, 112-13

path of time. It also allows for a revision in how we understand time.³⁸¹ In the quoted passage, Bergson also seems to suggest the coexistence of nonlinear full expanding viscous processes as captured by his image of the expanding balloon, along with the “halted” time that accompanies our “intelligent” nature to retrograde methods in the establishment of what is true. Parallel separate yet interrelated systems. In recognizing that the expanding balloon may at any time take unexpected shape, this image seems also to anticipate the images of “resonating vessel” and “resonating cistern.” I find these images promising and promisingly humane.

On a constructive note, Bergson argues that “to perceive it thus, as indeed we must do with any creation, novelty or unpredictable occurrence whatsoever, we have to get back into pure duration.”³⁸² What does this mean? We often tend to freak out every time we see the word “pure” because we have been conditioned, as a symptom indeed of our halting approach to time and moving, to reject anything claiming to be pure even though we tend to seek truth and facts. But, in the same way that Merleau-Ponty used the term “pure depth” (which incidentally is not irrelevant here), we can understand Bergson. I think he simply means duration as flow or moving itself before it is connected with any thing flowing or moving; Michel Serres and Jean-Luc Nancy both tend to use the term “naked” to indicate the same condition. The “pure” qualifier is perhaps equivalent to the “in itself.” Flow or duration or time or moving, each in itself as flowing, duration, time, moving apart from anything holding these qualities.

Barbaras: Perception is Reaction’s Delay

Barbaras

Continuing to explore the “experiential present” recall that Barbaras, who in this respect is developing on Bergson’s work, holds that “*it can be inferred that perception originates in the reaction’s delay.*”³⁸³ Perception then is, to translate to biological terms, related to the timing of *action potential*, the moving charges that provide virtual movement in the nervous system and actual movement in the musculoskeletal system. Perception originates, as Barbaras writes, “in the distance that separates the external impulse from the reaction.” The distance must be understood both physically—the separation of sites of stimulus as distant from central nervous site—and also temporally—as the timeframe created by neurotransmission speeds and the reentrant complexity of the nervous system. This means that perception involves engaging the vast experiential neuronal ensemblings where the external stimulating impulse encounters the patterns, memories, feelings, and much more that comprise our accumulated life experiences resulting in, not knowledge, but a reaction, that is, a responding movement and continuing experience. Perception is not knowledge although it is necessarily copresent with knowing; it is movement. Movement, in one frame, is the time-consuming movement of information throughout the nervous system. Barbaras, “Contrary to what traditional philosophy affirms, perception has in no way a speculative interest; it is not knowledge but *action*.”³⁸⁴ Talk about revolution! And

Comment [SG103]: Don’t forget Barbaras on tonus re Goldstein in D&D

³⁸¹ Hawking, *A Brief History of Time*, cite and pages?

³⁸² Bergson, *The Creative Mind*, (19)

³⁸³ Barbaras, ???, 99.

³⁸⁴ Barbaras, ???, 99.

Barbaras continues by writing, “the perceived is only that which the living subject reacts to.”³⁸⁵ The implications are significant, as Barbaras writes, “the object is not born of a disinterested relation to the world; it is on the contrary constituted by vital activity and, more generally, by action that needs to circumscribe stable entities within a flowing totality.”³⁸⁶ Thus, what we perceive is not the result of some passive recording of the world “out there” and it does not arise in some impartial measurement objectively given by the world “out there” and it is not done simply for curiosity. Rather the object is born of the process of movement that is conditioned by experience and by interest both of which are encountered and developed as movement (action potential) through the adventurous journey through the parallel reentrant processings of neurotransmission. Barbaras refer to the principle of self-adjustment that seeks coherence within this complex network as “a flowing totality” similar to Bernstein’s “smooth movement.”

Barbaras indicated that the level of perception among animate species correlates with the extent of the reactions’ delay. “A more complex organism perceives to the exact degree to which the reaction does not immediately follow the stimulus.”³⁸⁷ Humans are the slowest among processors, have the slowest reactions, and therefore have the highest level of perception.³⁸⁸ One might think of this measure as also correlating with the resonance of the “experiential present” as I’m developing it. The present expands, as the body’s biological tonus increases in complexity because of the extent of the Internuncial network including immeasurable ensemblings of neuron groupings, the vast complexity of the reentrant processes of coordination dynamics, fattening the experiential present because the whole body is organically functioning as a resonating cistern from which emerges coherent actions and the potential for coherent thought.

Merleau-Ponty’s Chiasm and Pure Depth

The term “fat present” is a way of imagining some aspects of the notion of “gap” that I have frequently referred to both in this book and elsewhere, but it offers a different sort of imagery that may be useful and friendlier. Gap suggests a negativity of sorts and indeed Barbaras even used the term negative in his discussion of movement as desire and distance. While gap may engage a romantic suggestion of the “emptiness” of eastern philosophy, there may be advantages in the west to construct images that are rich and fat. We can still do so with sophistication and suggestive subtlety.

One way to think of this fat present is in terms of copresence. Fat present is copresence; the common presence (identity) of two (or more) things each having identity based on distinction or distance from the other(s). This structurality is, as discussed a number of times before, a twoness that is oneness. Maurice Merleau-Ponty’s extensive studies of perception came to rest on the insight that all perception is grounded on the notion of distance or depth. Consequently, he was concerned about how we perceive **depth**.

Comment [SG104]: Read M-P sections of his classic perception book to add to this.

³⁸⁵ Barbaras, ???, 101.

³⁸⁶ Barbaras, ???, 99-100

³⁸⁷ Barbaras, D&D, 99

³⁸⁸ As we think about the development of AI/robots as we are moving into the future, this statement is highly significant. Robots are machines with virtually no reaction delay. I consider the implications of Barbaras’s statement in “Into the Future.”

Distance is a basic issue for psychology, philosophy, and studies of perception. Distance must be understood relationally and this suggests depth. The concern with how we perceive depth is an old one, usually understood as “a line endwise to the eye,” (an example of retrograde movement) and was thought to be derivatively perceived, added to an otherwise flat and static image produced by a two-dimensional array of radiant energy on the retinal surface.

Merleau-Ponty and James Gibson (among others) rejected the classical explanation. Notably, Merleau-Ponty’s ways of resolving the issue of distance and depth become fundamental to the construction of his “flesh ontology.” Depth comes to be understood as that which both allows difference and distinctness while creating a bond or connection or identity between perceiver and perceived. The exploration of depth is necessarily complex, yet it leads to profound insights.

Merleau-Ponty held that an essential aspect of every meaningful perception is a spatial orientation. It is always already there because it must be presupposed in the body holding some place in the world as the locale for perception. Depth is then a primordial spatial orientation. Merleau-Ponty holds that we come into the world as perceptible bodily beings; we belong to the “flesh of the world.” Being a perceiving body inseparable from the perceiving-perceptible world already orients the body.

The body has in its structure and behavior examples of distance and separation that are also unities. One hand touching the other hand is a favored example often contemplated by Merleau-Ponty. Another is stereopsis, having two eyes yet seeing a single coherent image. We, in fact, see the singular world clearly, under normal circumstances, through two eyes that see separate and distinct images. We can test this easily by closing first one eye then the other in a variety of situations. Difference, separation, is easily confirmed. Yet, thankfully our vision unifies these two into the experience of a single image; we know that there remain two and that they are different, yet they comprise one. Even vision situations in which there is a distinct disparity between the images separately seen by our two eyes interact to be one; they appear as a unified image that is nearly impossible to willfully separate into the two. This separation yet unity is fundamental to Merleau-Ponty’s consideration of depth and, interestingly, the crossing of the optic nerves in which the left eye is connected with the right brain and vice versa offers a rather literal example of Merleau-Ponty’s chiasm. Stereopsis is an excellent example of the constant blending processes of experiential neuronal ensemblings. It doesn’t just occur as an objective calculation of our optic neurobiology, it is rather a function of experiential ensemblings biologically seeking coherence. That is, seeing with two eyes draws upon the accumulation of our experience of seeing in order to create ensemblings of a coherent image.³⁸⁹

³⁸⁹ I remind of an experience many of us have had. When receiving new corrective lenses we often find ourselves disoriented, with poor depth perception, dizziness, and seeing double. This is the result of seeing “objectively” or in the terms of the direct visual stimuli with inadequate experience to create neurobiological ensemblings that are coherent. Adequate experience to keep us from danger is usually accumulated in a day or so. This kind of experience simply reminds us of the remarkably complex processes that are constantly at work in the experiential neurobiological ensemblings.

Depth at this naïve level then is understood as that dimension by which we see something from “here” that is at its place “there.” The here and there are contemporary in our experience. Here and there are joined in time through their visibility and this is depth, a space Merleau-Ponty described as having a “copresent implication.” Depth is inseparable from movement. Merleau-Ponty appreciates depth as a “sensitive space,” as “living movement,” as “lived distance.” Barbaras, in the lineage of Merleau-Ponty, understands living movement as fundamental. Depth, in this progressive consideration, becomes increasingly profound. It is that dimension that contemporaneously unites and separates; it is the condition of living movement, vitality. It is “a thick view of time,” or, in my terms the “fat present.” Depth, as Merleau-Ponty shows, is the “most existential dimension.”

Depth, we might call it more properly, following Merleau-Ponty, *pure depth*, when taken in this most profound sense, is a dimension that is primordial, allowing the perception of distance and the value of the distant. Primordial depth, in itself, does not yet operate between objects, between perceiver and percipient. Pure depth is depth without distance from here. In its thickness, preceding perception depth is perhaps difficult to grasp. Merleau-Ponty offers an analogy that both depends on vision and also foils vision to the point of replacing it with touch, with feeling, with anticipated movement. This analogy is dark space,³⁹⁰ the visual experience of night or total darkness. In darkness seeing is thwarted, yet seeing into the darkness elicits a feeling of thickness, a density, a materiality, a tangibility, an intimacy. In dark space everything is obscure and mysterious. Eugene Minkowski, an early twentieth century psychiatrist, who offered the idea of dark space, held that “the essence of dark space is mystery.” The experience of dark space provides a means of trying to grasp pure depth. Pure depth is depth without foreground or background, without surfaces and without any distances separating it from me. Minkowski understood dark space, which Merleau-Ponty identifies with pure depth, as “the depth of our being,” as “the true source of our life.”

We should also recall here our earlier discussion of the Ganzfeld procedure, because, like “dark space,” it offers a similar and alternative experience of pure depth. The Ganzfeld can be understood as the “pure field” or “pure vision,” the seeing before the seeing of any thing. As reported, it produces a sense of thickness and anticipation of movement, if also a blanking out of vision or an indeterminacy of whether or not one is seeing at all.

Pure depth is key to understanding Merleau-Ponty’s *flesh* which, like pure depth, as pure depth, is always already there as precessive, that is, as “the formative medium of the subject and object” and also as progenitive, the “inauguration of the where and when.” The moving body is fundamental to flesh, because through movement flesh begins to understand itself or become aware of itself. Flesh, without the moving body, is not yet even possibility in that percipience is disconnected from perception. The body in living movement is then, as Merleau-Ponty termed it, a percipient-perceptible, that is, an entity possessing the potential to perceive while also being capable of being perceived. The living movement is an intertwining of two sides, the adherence of a self-sentient side to a sensible side. The moving body blurs the boundary between the flesh of the world (depth) and our

Comment [SG105]: Does he actually call it pure depth or is this Cataldi?

Comment [SG106]: Do I talk of this somewhere else in this book?

³⁹⁰ Perhaps an imaginative parallel is the current interest in physics and cosmology to identify dark matter as comprising 97% of the universe and essential to its existence.

own bodily flesh. The body as also the environment (the world) comes to exist in an ambience, a primordial given, of depth, the hidden dimension behind everything.

This doubling is for Merleau-Ponty a “reversibility.” Reversibility is one way he expressed the necessary interconnection among distinctions, copresence. A subject requires an object and vice versa; they are reversible; as vital movement they oscillate back and forth among themselves. The term oscillate adds both continuing repetition and a fuller measure of movement to the term reversibility. Movement is an essential quality of reversibility; movement is necessary to occlusion that is often key to the perception of depth. Yet, this reversibility is never complete. This consideration of completeness introduces a fascinating phase in this argument, I think. Complete reversibility would result in identity among the distinctions and a collapse of perception through the collapse of movement. Without a negativity or incompleteness there is no desire (to use Barbaras’s term) or movement; there is no energy to gap. Were the touching of one hand with the other to be completely reversible it would not be possible to distinguish one hand from the other, the touching from the touched. In stereopsis, the images provided by each eye would be the same and there would be no negotiation and construction, no blending of experiential ensemblings, between the two, thus no vision. The term chiasm here identifies this gap or crossover space; chiasm is always also chasm. There must remain this undetectable in itself and unbridgeable space or gap or synaptic gap or hiddenness or negative or difference or distance for reversibility to be incomplete and thus to continue oscillation. Incomplete reversibility, as the presence of nonlinearity and the threat of incoherence, is not some flaw to be overcome in perception, it is rather the very motor that drives the oscillating movement of reversibility that allows for simultaneous interdependence and distance, for vitalizing copresence. Since the chiasm is hidden, since chiasm precedes and makes possible reversibility, it can be thought of as depth or better as pure depth as analogized by dark space. Chiasm, pure depth, this incompleteness is the source or condition of percipience and at the same time unifies flesh ontology.

Complementing the copresence of here and there that is depth or pure depth we can add Bergson’s discussion of “pure duration.” Bergson held that the essence of time is flow or duration; it is the temporal implication of the copresence of now and then. It is the flow of time before there is a past, present, or future. It is the necessary predecessor on which the retrograde movement of the true can be built. Duration can be understood, in the terms of this present discussion, as the copresence of the past and the future. It is the flow (waves and eddies) that is constantly conjoining, while also distinguishing, time past and time still to come. It is in the flow, the thickness and richness of the copresence, that time is experienced. We might even think of duration in biological terms. The past is comprised of memory, images and accumulated experiences marked by a variety of implications of “pastness” yet always available to what is present to us, while future is comprised of images and expectations marked by a variety of implications of “not yet” or “potentiality” or “anticipation,” yet always available as engaged in our experiential present. When we think about it this copresence of past and future in a fat present is what makes it possible for us to experience time at all. It is what gives time the experience of duration with orientation.

Thelen and Smith: Complex Dissipative Systems or Local Pools and Eddies

In their *A Dynamic Systems Approach to the Development of Cognition and Action* (1994) Esther Thelen and Linda B. Smith study behavior in early childhood, especially the acquisition of functional play, first words, and bipedal walking.³⁹¹ Their research approach was located on the forefront of the development of the study of dynamic systems; systems that are characterized by their nonlinearity, their violation of thermodynamic equilibrium, and their openness to novelty.

Based on their analysis of the Belousov-Zhabotinskii chemical reactions, Thelen and Smith acknowledge the existence of self-organizing systems, not simply as some odd exception to the generally accepted preponderance of closed systems that operate in thermodynamic equilibrium, but rather as common and important. They are systems of nonlinearity that are self-organizing. As Thelen and Smith report Nobel laureate Ilya Prigogine and Isabelle Stengers found that the violation of thermodynamic equilibrium is a local effect accomplished by the uneven distribution of energy. Prigogine and Stengers referred to these structures as “*dissipative structures*” because they maintain equilibrium by drawing energy from a source of high-energy potential, doing work, and dissipating some of this energy, in turn, back to the environment.”³⁹² Thelen and Smith offer a cogent summary description of these systems.

Special properties of complex dissipative systems may be thought of as local perturbations in what would otherwise be thought of as a thermodynamic universe symmetrical in time and space. These systems break the symmetry by concentrating energy, and thus order, in local pools and eddies. But these local concentrations are maintained only by a continual flux of energy and matter. It is this continual flux that is the wellspring for new forms.³⁹³

In the present context of my efforts to construct the notion of a fat present, I’d suggest that it might well be understood in terms of the image of “local pools and eddies” Thelen and Smith used to describe complex dissipative systems. While the predictable and stable world of thermodynamic equilibrium, the world of clock time, regularly marches on, the biological animate organism is a complex dissipative system that draws high amounts of energy from the environment where it is concentrated in local pools and eddies, what I’m calling the “fat present.” In these pools and eddies, thermodynamic principles of time sequences and principles of linear cause and effect do not hold. As fitting to the image of eddies, this fat present is a swirling circulating local dynamic that is, as Thelen and Smith point out, the “wellspring of new form” or as I would suggest, the wellspring of vitality.

Important in Thelen and Smith’s early discussion of dynamic systems is that they are essential to comprehending the most quotidian aspects of life, acquiring the ability to

³⁹¹ It is my sense that, despite their title, Thelen and Smith’s work has been less influential because it is focused on the study of infants. For example they acknowledge Kelso’s work yet Kelso’s later books barely give a mention to Thelen and Smith’s work.

³⁹² Thelen and Smith 53. Cite the Prigogine and Stenger source as well.

³⁹³ Thelen & Smith, 54.

walk³⁹⁴ and talk and play. They show that from what they often refer to as the “view from above” (similar to what I, following others, have called “retrograde movement” and “backfilling” and is the standard rational view) these processes seem to unfold in a predictable and systematic way, as described by Jean Piaget, for example. However, when these same processes are understood from the perspective “from below” they look quite different; in this view they are “messy, fluid, and highly context-dependent.”³⁹⁵ What is important is that in the view from below the local fluctuations that occur are unpredictable, yet because of the complexity of the reentrant degenerate (Edelman’s terms) system the impact of this seeming “noise” is also unpredictable. Yet, this very noise is ultimately the source of new and emergent patterns.³⁹⁶ The local gives variation and novelty and vitality to the system through perturbations with unpredictable consequences, all the while maintaining global consistency. It is the presence of the nature of animate movement that connects the unruliness of the local with the seeming coherence of the global.³⁹⁷

Important to the “fat present” is that it emerges, or can be seen in a view from below attending to the local where the pools and eddies are prominent rather than the broad flow of the stream from source to mouth as seen from above. The “fat present” draws vast energy from the system plumping the knife-edge meeting of past and future into a swollen swirling vortex where in experience all spaces and times mingle in an unruly defiance of the sovereignty of the linearity of time. Where in closed thermodynamic systems it is impossible to account for anything actually new, novel, or free (that is what “closed” nature of the perspective means); in these pools and eddies the essential condition is freedom, novelty, unpredictability, nonlinearity, metastability. Both views provide essential perspectives on our comprehension of living reality.

TARDIS is the Fat Present

A standard of science fiction is the issue of conquering the limitations on travel to places beyond the earth’s solar system. Given the age of the cosmos and the limitation of travel to the speed of light, it is an impossibility of science to conquer traveling distances even at light speed. Yet in science fiction there are endless solutions. Perhaps most common today are “worm holes” or “rips in the fabric of time” or “wrinkles in time” and travel at “warp speed.” Dan Simmons’ *Hyperion* series featured a cosmic tree. H. G. Wells’ time machine is another strategy. TARDIS (Time and Relative Dimension in Space) is the clever solution to this issue taken by the 50-year old TV series “Doctor Who.” TARDIS is a time machine capable of traveling to any time from the beginning to the end of the cosmos. TARDIS is also a space ship that travels through wormholes it would seem anywhere in the universe. TARDIS appears on the outside as an ordinary blue British Police Call Box; a small blue square building with a door opening to a small space where, one would suppose, equipped with a phone connecting directly to police headquarters. But TARDIS is larger on the inside

³⁹⁴ For a summary of their analysis of learning to walk see “A Dynamic Account of Learning to Walk: Ontogenetic Landscape,” pp. 121-25.

³⁹⁵ Thelen & Smith, 215.

³⁹⁶ See the analysis of this in Thelen and Smith, 158.

³⁹⁷ For fuller discussion of how the dynamic systems approach is affective at explaining both global order and local details, see Thelen and Smith, 215-17.

than on the outside. Indeed, the Doctor always anticipates and is a bit cranky with every newcomer to enter the TARDIS since they always say with astonishment, "It's bigger on the inside than the outside." But this is no illusion and the scale of bigger is remarkable. The TARDIS seems endless in the dimension of its interior. It seems to center on a circular or hexagonal control panel of the steam punk style with levers, toggle switches, clunky old monitors, plungers, tubes, cranks, and light bulbs. In a way TARDIS enfolds the largest dimensions into the smallest spaces turning space inside out or outside in. The TARDIS might be offered as an exemplar in grand terms of the fat present since within the TARDIS all space and time past and future are virtually present. The TARDIS is the meeting place or intersection or chiasm of all timespace; it is the present of experience; it is all existence available to the present.

The fat present is like the TARDIS in many respects. First, from the perspective of any world in which the TARDIS exists it appears as a small square building of finite purpose and structure; normal even quotidian. Yet to experience the TARDIS is to open space and time to the richest most extensive dimensions, to all or everywhere and everywhen. I suggest this parallels Thelen and Smith's construct of "global" and "local." Against the background where the cosmos, or any specific place, is acting according to the common rules of cause and effect, the linearity of time, the elimination of the nonlinear, the TARDIS is an ordinary police call box. Yet the experience within the TARDIS, what is local to or inside the TARDIS, is where the linear march of time is not sovereign, space is not uniform or continuous. Indeed, entering the TARDIS sitting on a street in London is to enter the experiential space of all time and space; and as every companion traveling with the Doctor knows for fun and adventure and especially the unexpected the experience of traveling with him far outpaces any other kind of experience; it has dimension and adventure; it is characterized by nonlinearity, the drama that is the story. Traveling with the Doctor is to be constantly at risk of death, but more commonly in the presence of the immanent ruination of the earth or another planet, if not the entire cosmos. The characters encountered when traveling with the Doctor are of every imaginable shape and composition—although most have some anthropic semblance and speech however limited and odd. The Dalek are exceptions looking mostly like trashcans with very limited vocabulary (Exterminate!). Death, annihilation, injury, loss, torture, pain, the unspeakable—that would be incoherence—are always threatening. And in the face of this chaos, one of the most common things the DOCTOR says is "I don't know." But it is always exciting and full of life.

So I propose that TARDIS is a clever mechanism—an analogy—by which we can understand and comprehend fundamental aspects of fat present. What is fun in this analogy is that we live our lives in the fat present aboard TARDIS; but we imagine that there is a linear, sensible, ordinary, meaningful, reality characterized by everything in its place and minding the rule of law, where we are supposed to live. This is the most fun realization of all, isn't it? That the world we think of as so orderly and predictable and lawful is but one imagined scenario?

Neurobiological Tonus

We commonly refer to muscle tone, the continuous and passive partial contraction of the muscles or the muscle's resistance to passive stretch during resting state. We all know that

Comment [S107]: Leave this section out and then go directly to a summary of this chapter.

muscle tone maintains posture and is equated with healthy fit muscles. We also know that muscle tone is not simply passively acquired, but rather it takes frequent repeated weight bearing exercise of the muscle to acquire tone. Unused muscles quickly lose tone. Likely we also understand that we use the term “tone” to indicate the importance of the persistent interaction among paired and opposing muscles or muscle groups. All muscles require paired opposing muscles to enable movement. Muscle tone has to do, in part, with these opposing muscles acting in concert. Two distinct and opposing muscles working together, each necessary for both the realization of and the limitation of the other, achieve muscle tone, rather like musical concert. Without muscle tone, our bodies could not play. And it is perhaps not irrelevant that the common loss of muscle tone through aging and reduced movement and change in posture that correlates with imbalances in muscle tone is why our physical play decreases as we age whereas kids whose existence seems to be in constant play.

It is common that we forget that the actions of our muscles to achieve movement are through and through neurological. Certainly muscle tone is not limited to the strength and health of muscle fibers. Muscle tone necessarily involves the neuromuscular system within the muscles—the annulospiral receptors of the muscle spindles (proprioceptors)—and the proprioceptors that gauge muscle tension—the Golgi Tendon Organs in the ligaments. These proprioceptors conjoin the nervous system and the muscle system and serve as poster children for tone. The system involved in muscle tone is the extraordinarily complex feedback feed forward looping reentrant system that constantly anticipates and responds to both the environmental demands on the body as well as the intentions that shape the movement of the body. Tone is tensional readiness yet relaxed. Tone is oscillatory micro-movement that pervades neurobiology.

It is appropriate, I believe, to understand neurological coordination dynamics in terms of tone. Coordination dynamics exist for the animate organism because of the multiplicity (parallel systems) and the importance of opposing positions to co-exist (metastability), the complexity (on the order of the most complex system in the universe), the internal variations (neurotransmission times, for example), the unpredictability (nonlinearity, due in part to reentrance), the absence of some central clock or executive director,³⁹⁸ and the essential connection with the exterior (the environment, the other). As ongoing living animate organisms coordination dynamics maintain tone throughout the organism, that it be even viable.

Tone, as a quality of movement, is accompanied by feeling; as tone achieves moments of concert, play, coherence—all of these I believe are modeled on the experiences of smooth

³⁹⁸ The notion of an executive director is a curious one. It seems there is a tendency to attempt to find one; to locate it in some specific area in the brain perhaps. Yet, were we to take seriously the existence of such an entity, for what else can one call it, raises questions and concerns I doubt we are prepared to answer. What are the bases for the executive decisions? What establishes these bases and criteria? If it is anything other than the impersonal processes of genetics or evolution or the maintenance of the organism, I doubt we have any suitable answers. If we are satisfied with these impersonal processes as establishing the basis for the executive function then we are little more than robots.

movement—we experience feelings of vitality. A toned body is a neurobiological resonating cistern—the naked readiness out of which we exercise our developing skills to live our lives (occasionally) with grace and intention.

Comment [SG108]: Use this properly in the way Nancy and Serres do.

[See also Barbaras D&D on tonus via Goldstein and totality of organism. [discuss muscle tonus; include the Goldstein and barbaras stuff. And the physiology/neurology as well. Show this tonus corresponds with reentrance in brain and is fundamental ... Juhan has good stuff on this. Key to meaning and coherence. Movement.]

Comment [SG109]:

Comment [SG110]: Impt. Consider how and where to do this.

]

The AZ guy and Penrose on the time in the neurological process???

Comment [SG111]:

[neurotransmission timing & coordination dynamics, Penrose, AZ guy, reentrance, tonus, Kelso (and Morowitz) and coord dynamics, ... the actions of time/sovereignty of time]

Roger Penrose shows on basis of neuroscience that in a certain quantum frame linear time sequence isn't sovereign. See Evernote note on this

Comment [SG112]: Evernote impt ... part of resonating vessel.

Vitality and Fat Present

[summary and conclusion of this chapter and the book]

Comment [SG113]:

Integrate these or not in the text above??

“Well ...”

Consider a situation that we all regularly experience that offers further evidence of the experience associated with the fat present. This is the situation that occurs when someone is asked a question. It is common for the answer with a sentence beginning with words like “well,” “so,” “but” or “um.” More polished responses simply pause briefly before beginning a sentence. If we ask what grammatical and semantic role these words serve, there is none that I can determine. These words or sounds do not mean anything or serve any grammatical functions. It would be interesting to see how one would diagram these words using that old technique. What they do is fill with a conventional word the time/space for the resonating feeling processing that occurs before the answer can begin. This is similar to the gearing up of “response potential” in Libet’s experiment that can lead to the tipping point that offers a speaker the confidence—“faith” is not an inappropriate word—to begin speaking. I like to think of the term “well” as invoking the vast well or cistern (the deep well of our past as Kundera??? referred to it) of our accumulated experience (knowledge) selecting and sorting and comparing and prioritizing and blending ensemblings into ensemblings before speech can begin, before the first word can be said with the promise that a coherent utterance will follow. Some of the time is required simply to allow the conjunction of different processing speeds over different length neuronal pathways. All this complexity occurs while we speak the word “well,” approximately a half second. Then consider how speech proceeds. It almost never unfolds with the speaker knowing all of the words with well-formed sentences complete to the end of the statement. It unfolds on the feeling—a feeling of faith or conviction or confidence or iconic knowing—that one should move in a certain vague direction. Sometimes we lose our way as we speak and sometimes we halt or falter, but usually we simply find our way merrily along some tangent.

We have similar experiences in test taking. We read the question or problem and then briefly await the feeling that we know how to begin and the direction to proceed (or worse, we wait and wait only to realize that we haven’t a clue, but then we have to muster some feeling of direction). These are special cases where we have a chance to observe our own response potential filling time in the fat present ginning up to move on as it is moving on in ginning up.

Another kind of implication of the fat present is the very structurality of the bread and butter methods of our reason and learning and creativity. Let me begin with comparison. Comparison is perhaps the most fundamental operation of thought and learning. Technically comparison is the consideration of the implications of the likenesses and differences between two or more things with respect to some third quality or measure or value. Comparison requires the co-presence of two things that are different from one another, yet that have some common attribute that can serve to evaluate them and lead us to comprehend and appreciate both more fully. Comparison thus depends on co-presence of difference as well as the co-presence within sameness. Since comparison is among the most quotidian of human analytic operations (both conscious and not conscious), these operations involving oscillation and recurrence must be co-present in some fat present

Comment [SG114]:

Comment [SG115]: if I move the mysterious half second to the top of chapter then this can be at the end as implications??? Yet, I don’t really want to end the book w/ these examples. Need to come up w/ different strategy for location.

duration. Comparison must be understood in terms like that suggested by Massumi of the resonating vessel. A whole lot of intertwined processes are co-present outside of some linear means all the while flowing through time. Comparison often implies hypothetical inference, which I discussed in terms of Peirce. Then I just want to comment on word use. The word “unique” has entered our popular discourse now to signal something that is “quite distinct or unusual.” The word actually means incomparable and therefore it means one of a kind, impossible to pair with anything for purposes of comparison, and thus means something more like incomprehensible.

Microexpressions

Microexpressions provide another interesting phenomenon that can be understood more richly in the context of the fat present. Facial expressions related to the communication of emotions have been a concern since Darwin. In the mid-twentieth century studies like the landmark work done by ?? Condon and ?? Ogston who studied a brief act of communication in micro detail based on film frames of 1/125th of a second revealed that more is going on in facial expression than simply broad easily identified expressions. Psychologist David Matsumoto founded Humintell to study and analyze microexpressions. He defines them as lasting “less than ½ second: they occur when people are consciously or unconsciously trying to conceal or repress what they are feeling.”³⁹⁹ Humintell is a commercial enterprise offering instructional products and workshops on how to recognize and identify micro-expressions which Matsumoto holds most people don’t see, without his training of course. In a radio interview, Matsumoto indicated that for most purposes there is no point in learning to recognize and read microexpressions, while it is important to interrogators and perhaps people in human relations.

Of course, again I’m not the expert here, but I would see microexpressions differently than does Matsumoto. The issue relates to the backfilling implications that we raised with Libet’s work. Because a microexpression has duration of less than half a second, there is not time to shout out “I see it.” A stimulus needs to be sustained for half a second, as we learned, before it becomes something of which we have conscious awareness. This does not mean however that we don’t perceive, in some sense, microexpressions or that they don’t affect us. I think there is no contest about us being able to perceive and be affected by extremely brief exposure. Subliminal message experiments have demonstrated this point. While we can’t say that we have seen a microexpression or what was being expressed, we can notice that we feel something (and something we can often identify, like trust our doubt or relief or tension) knowing that it has to do (even if vaguely identified) with facial expression. Disagreeing with Matsumoto I think we are constantly impacted by microexpressions; they are the aspects of expression that add coloring and value and mood and veracity and sincerity to any expression. They make the difference between a feigned smile and a genuine smile, between an ironic smile and a conspiratorial smile. Microexpressions make facial expressions personal and individual. They have everything

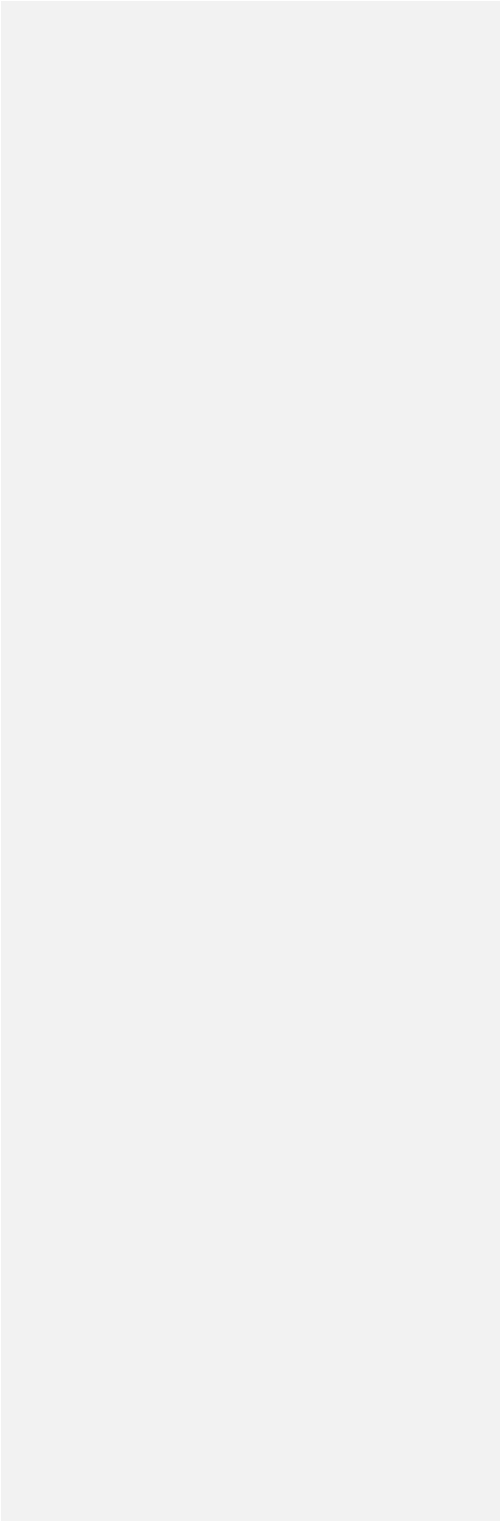
³⁹⁹ <http://www.humintell.com/macroexpressions-microexpressions-and-subtle-expressions/>. For a brief history of the study and fictional attention to microexpressions see: <http://www.humintell.com/microexpressions-2/>

to do with statements like “you have such a pretty smile” or “your face seems so open” or “are you not feeling well?” or “that person clearly didn’t like me!” or “what a liar.”

I would also disagree with Matsumoto’s limitation of these microexpressions to only those occasions when people are consciously or unconsciously trying to conceal or repress what they are feeling. I’d first argue that the duration of a microexpression could not even be the result of a conscious decision. To test this out, try it out. This is similar to the situation in Libet’s experiment; we simply cannot consciously suppress a decision to act in the half second after we acknowledge that have made that decision. Same with microexpressions; we don’t have enough time in the duration of a microexpression for it to be something we decide. Indeed, I’d argue this absence of possible intention is the most exciting and interesting aspect of microexpressions. This is why microexpressions have such popularity in current drama, the TV series “Lie to Me,” for example. Microexpressions emerge from the fat second seemingly on their own because they are evidence of the processes occurring in the “fat present” of which we can have a subtle awareness but cannot specifically direct or control in detail. I’d then suggest that there is always something of a “truth” to microexpressions especially related to feelings; the opposite of Matsumoto’s definition. Their valuation is not readable in the microexpression in isolation, but only in the context of the flow of expression and based on the history of the facial expressions of the person involved.

The last point on microexpressions I want to make is that I think they are not properly named. I think it would open the topic more broadly to what we commonly identify as “facial expressions” as “facial gestures.” A gesture, in this case the movement of aspects of the face, is and can be expressive, but this does not at all adequately describe its function. Gesture is always an effort to affect, to touch, and to interrogate as well as to express. We would then read micro-facial-gestures as much more complex than expressing, more fully as strategic and agential and interrogative. As micro-facial-gestures, we’d be more interested in the movement aspect of the face, rather than the set positions we so often identify (like a children’s drawing or an emoticon) as a smile or a frown. Facial gestures are a flow of movement and we are all skilled in being affected by this flow. A good point of evidence for this is the rare case in which the face is “frozen” in an expression. We read the very sense of the limitation of movement as cold (surely related to the word frozen) or hard (as in like a rock that doesn’t move) or false (we often call it a mask) or dead or flat (a psychological condition of being without emotion). We often describe micro-facial-gesture in terms of seeing something pass across one’s face or a flicker of something in a face.

Micro-facial-gesture must be understood as a point of access to the ongoing experiential neurobiological ensembling processes. The face is a powerful locus and accumulation of perceptual channels: eyes, nose, ears, tongue, skin all in constant movement through micro-facial-gesturing. The copresence of animate organism with environment has some sense of concentration on the face. One might consider that the endless stream of micro-facial-gestures is integral to the oscillatory movement that is constantly engaging the copresence of organism and environment in a fat present. The micro-facial-gestures both affect and express the feeling aspect of this complex oscillatory movement.



Appendix: Movement and Experience, Religion and Religions

Religious Studies: Shaping the Next Generation

Review of the following contents ideas for this chapter. Could make this chapter into a whole Part w/ separate chapters.

The First Generation – 1963-2010..... Error! Bookmark not defined.

The Next Generation – 2010 – 2050?; Study Religion ... What and What For?Error! Bookmark not defined.

Numbakulla and Sacred Pole: *Ab Origine* – Difference and the Construction of Theory and Subject and Our academic selves; By Any Other Name Still Primitive; In Search of Dreamtime Error! Bookmark not defined.

Storytracking Error! Bookmark not defined.

We (yes, even academics) are How we Communicate..... Error! Bookmark not defined.

***Sui generis* Theory of Religion**..... Error! Bookmark not defined.

We Study What Confirms our Identity: Religious Study as Gestural ProsthesisError! Bookmark not defined.

Tillich, the Unacknowledged Theoretician of Our Entire Enterprise; Theology and the Academic Study of Religion..... Error! Bookmark not defined.

Prototypes and Heritages for Religious Studies: Mostly Protestant ChristianError! Bookmark not defined.

Religion and Religions: Inventions and Descriptions Error! Bookmark not defined.

Accounts (preferable to Definitions?) of Religion; Religion as Vitalizing ProvocationError! Bookmark not defined.

Invention of World Religions..... Error! Bookmark not defined.

How Can I Find My Place When The Map Is Now the Territory?Error! Bookmark not defined.

Religion and Culture Error! Bookmark not defined.

Comparison: It is Still Magical..... Error! Bookmark not defined.

Transcendent: Is it the Ultimate Academic Limitation and Hang-up or the Last Best Hope? Transcendent without Being Religious, Is it Possible? Error! Bookmark not defined.

Philosophy and Science and the Possibility of the Non-religious “Radical Other”. Error! Bookmark not defined.

Materialist Strategies Error! Bookmark not defined.

Moving Beyond Mind/Body and Much More Error! Bookmark not defined.

Experience: Senses (Perception), Knowledge, and Body Error! Bookmark not defined.

Language, Metaphor, Gesture [rethink ... maybe as perception and knowing]Error! Bookmark not defined.

Coordination Dynamics Error! Bookmark not defined.

Meaning or Co-presence of Coherence/Incoherence; Knowledge and Intelligence

Bookmark not defined.

"To Risk Meaning Nothing is to Start to Play" Error! Bookmark not defined.

Information and Posthuman: Should we Consider Postreligion? **Error! Bookmark not defined.**

Religion Into the Future

It was the fall of 1967 when, with a Bachelor of Science in mathematics and a Master of Science in business in hand, I left my job as a research analyst at the Coleman Company in Wichita Kansas to begin my study of religion at the University of Chicago. I was then unaware that one likely factor in my acceptance at the Divinity School was the rapid gearing up of graduate schools of religion to meet the increased demand for religion scholars that resulted from the 1963 SCOTUS on Schemp vs. ????. This ruling opened the way for the establishment of the study of religion in state funded universities based on the distinction that studying "about" religion was ????? quote and therefore not in violation of the constitutionally based separation of church and state. Nor was I aware that I was entering a brand new academic field of study; the study of religion as a human and cultural subject rather than on the basis of a study based on religious belief or affiliation.

It has now been half a century since I entered the study of religion. Based on my own continuing study of religion, yet the realization that I am among the last of those who started in the '60s, it is time to declare the end of the first generation of study of religion and to take a bit of stock. Certainly much was achieved during this time, yet the issues of Schemp v. ??? continued to shape the discourse throughout. The overwhelming Christian, particularly Protestant, influence on this secular study continued to shape the field in profound and persistent ways. The questions "How does one understand religion in such a way that is evenly and appropriately representative of all religions?" and "How do we even define religion when the religion that most shapes our every category and image is Protestant Christianity?" have yet to be adequately resolved.

As Thomas Kuhn showed in his ??? paradigm shifts typically occur between generations. This is because the "normal science" of the one generation is so gesturally normalized that it precludes the openness to fundamental change. Certainly simply the longevity of my presence suggests I am the "normal historian," yet throughout I have often been an unwilling follower perhaps owing to my mathematics and business background; and to my being a dancer and dance teacher through much of this time. Whatever the case, and it might well be sheer delusion, I think it is important to at least make a few comments based on my experience outlining some of what I see should be mandates for the new and emerging generation of religion scholarship.

Religion/Religions

When I was a graduate student at Chicago it was common to take a crack at defining religion. Short of any success at this endeavor was the collection and criticism of extant definitions. Then as I began teaching I found it common to many religion courses, but especially to Introduction to Religion courses, to begin with a broadly ranging discussion of "what is religion?" I recall eliciting from students comments and associations with the

word “religion” that I dutifully wrote on the chalkboard followed by an effort to get some sense of this topic we were studying. I have a hunch that many of my faculty colleagues would end this same endeavor by suggesting that for all the possibilities that might be proposed, “for this course we will adopt the following definition.” I could never bring myself to commit in such a way, so I perhaps took the less effective route of leaving the term all too vague and undefined.

Our difficulties in engaging in any very clear way with arguably the most important term, the very term that names the topic, are several. With a strong Protestant Christian heritage the adoption of the familiar as the paradigm, as the best example, was and remains almost unavoidable. To include anything that seems to be religion but is not Christianity then requires an understanding of the comparison necessary to lead us to a more inclusive understanding of this term. Our understanding of comparison has all too often been simply how are they like/not like us. Usually unstated yet heavily influential is the principle that the more they are like us the more confident we are in including them in the category. Thus we name the “world religions” as akin to the world wide ?? of Christianity and we lump together the hundreds of others in categories whose labels are anything but value free: primitive, ethnic, popular, folk, ancient, new, cult, practical, lived, or simply “other.” Another strategy for inclusiveness is the great comparative project of anthropology—E. B. Tylor and Sir James George Frazer—that digested the endless ethnographies of cultures the world over to reveal, or more accurately to construct, supposed underlying patterns that allowed comprehension. This approach was taken up mid twentieth century—Mircea Eliade—as an early contribution to establishing a foundation for an academic non-religious study of religion.

Another outcome of this effort is the broad establishment in both the general public in modern Western cultures as well as academic students of religion of a strong correlation between “religion” and the value stated simply as “good.” Robert Orsi ... This defining criteria often leads to a distinction of “real” or “true” versions of religions in contrast with “false” or ... Thus, whatever religion is of concern, the true form deserving of the designation religion is invariably loving, friendly, nonviolent, welcoming, tolerant, community supportive, family oriented, value supporting.

Perhaps a result of both the “book” basis of Protestant Christianity and the “writing/language” basis of academia, the academic study of religion has been largely directed to focus heavily on language-based articulations of meaning, on scriptural as writings rather than as guide for application, on thinkers/writers representing the intellectual and authoritative segments of religions. As a result religions without writing are often ignored or receive lesser attention. Within religions, those who don’t read and write are often ignored or receive lesser attention. Religion is, by default, then understood as predominantly thought, ideas, doctrine, history, theology, scripture, and intellection. Even the studies of ritual and practice are typically focused on the writings within the tradition that appear to explain these actions and behaviors.

Despite a half century of effort it seems that the academic study of religion has yet to achieve much success at several fundamentals. It has not seen much success at articulating its most distinctive term(s). It has not well understood such fundamental academic methods as definition and comparison and categorization.

[from other bk] religion and the study of religion—and the academic enterprise more generally—and religion(s). The approach follows this account of the play of movement, a play of philosophy and neurobiology, as a guide (inspiration) and method to keep the religioning in the religion and the energy of inquiry in the study of religion(s). It has become a common concern to be clear about whether the religion in the study of religion is singular or plural. I'll tend to use the singular when I'm referring to the development of a theory of religion or to the study of a specific religious tradition. In the academic enterprise I think it essential that a theory of religion is developed. As I'll argue later, my preferred language is an *account of religion* rather than theory simply because I think the term "account" is concrete yet leaves the matter more open. An account of religion is implied if it is not made explicit anywhere the term is used; it is a cultural construct for comparative use, but in the academy it needs to be discussed with considerable self-consciousness. I tend to use religion(s) when I am referring to the collective material that is designated by our accounting of religion. This ambiguous singular/plural reference indicates when we are about our efforts with respect to specific bodies of material related to the "lives of other men."

Beyond Place

[from other bk] Religion is often equated with those points—origins and centers and truths and beliefs—that provide stability and dependability, particularly to human existence, against the constant threat and evidence of instability and relativity of life as lived, as experienced. The very nonlinear, thus unpredictable and indeterminate, character of existence and human life makes finding this "firm foundation" impossible within human reality, so, as the argument goes, religions pose some extra-human reality to provide this axis. It seems somehow ironic that it is precisely the effort to establish the most stable and reliable foundation that calls for the greatest and most fanciful inventions, be it religious or scientific. In the mid-twentieth century the renowned Mircea Eliade formalized the articulation of this view in the academic sphere and he charted its manifestation in religions the world over. Such an endeavor has now gone out of academic style, yet it continues to be perhaps the most common folk understanding of religion. Religion scholars, in distancing themselves from this thinly veiled academic theology of religion, disperse in various directions to understand religion in terms of its history, its systems of thought, its art, its social and cultural functionality, its materiality and so on acknowledging perhaps somewhat tacitly that the mark of distinction of religion is indeed the reference to something "other" worldly, "super" natural, and the like. Perhaps the common trait is the stability and foundation and axel qualities that are attributed to these distinctive markers (or makers); so perhaps we have moved little after all from the nostalgia for a reliable place. The distinctiveness to reliability that makes it religious is invariably something "beyond" or "other." Ultimately that's all

we have for distinction. The study of religion remains firmly devoted to following the dictum of Archimedes, whom Jonathan Smith so regularly invoked, to establish a “place on which to stand;” that is to establish a definition, a clearly demarcated category, a solid theory. Yet, in the academic study of religion the only reliable place to stand has a religious heritage of otherness; this conundrum has been the bewilderment of religious studies. Typically what distinguishes religion theory in actual terms is the scholar’s training and lineage and her or his personal academic and religious accumulated experience; gesture and posture.

[several parag from other bk] The question to pose at the outset of considering religion and the study of religion(s) from a philosophical neurobiological account of movement is: can our understanding of religion and the study of religion(s) be enhanced by focusing on the *metastable* and *nonlinear* qualities of movement wherever it occurs? What would constitute a generally recognized enhanced study of religion?

Metastability,⁴⁰⁰ to be developed much more fully below, is, as I am using it in this book, the holding together of two things that each requires a distinction from the other yet are inseparably entwined. I am suggesting that movement, play, difference are exemplary of metastability. In quantum mechanics a classic metastability is the nature of light being at once wave and particle. These two are mutually exclusive, yet a full account of light is not possible without including both. Metastability is the characteristic of movement to be both in no place (always in transition) and the way we account for place over time; movement is the distinction yet copresence of self and other/environment, here and there; movement is incorporeal corporeality. As I will show metastability is at the core of the coordination dynamics that afford us coherent experience, the correlate of smooth movement.⁴⁰¹

The academic enterprise is based in a general way on linearity; the cause and effect relationship is based on the assumption of the sovereignty of linear time and space that is regular and homogeneous. Linearity supports meaning, explanation, law, principle, assumption, axiom, proof, even interpretation. Yet, it is clear that nonlinearity is common in, even characteristic of, reality and especially in the most dynamic and creative contexts. *Nonlinearity* is common in highly complex self-adjusting system—nervous system, society, history, religious traditions, and so on. Nonlinearity is when the ongoing processes of such systems fold back in an impactful way into the system. Sequential linear time loses its sovereignty and freedom (in some sense) reigns; indeed, handling freedom (achieving coherence) is

⁴⁰⁰ Metastability is a term often used in coordination dynamics in the context of neurology, but it is also a common term to describe a kind of instability in electrical systems that usually quickly dissipates.

⁴⁰¹ In *Vitality* I make the effort to argue rather extensively that smooth movement is something that can be described and that it functions neurobiologically as the objective of coherence. Indeed, an outline of an account of coherence is presented there.

an important part of the dynamics of coordination. Nonlinearity pertains also when random events outside the system impact the organic process of self-adjustment and coordination. A few years ago chaos theory made much of the pervasiveness of nonlinearity. In mathematical terms nonlinearity can be grasped by recognizing that much of the world is based on mathematical terms such as π . Since the exact value of π cannot be calculated then the calculation of moving and interacting objects turns out to be mathematically impossible; in simple situations it is closely approximate. The common academic strategy upon encountering nonlinearity is to eliminate the potential feedback variables through simplification or isolation (controlled experiment) and to approximate the nonlinear with the linear (for example, round off to the third decimal point). However, recent developments in physics, psychology, mathematics, neuroscience, among other fields show that the inclusion of metastability and nonlinearity is not simply an issue of accuracy, but rather the inclusion of metastability opens anew the appreciation of novelty and creativity and coordination dynamics and, as I have explored elsewhere, vitality.⁴⁰² In other words, creativity and freedom and even vitality are born in the conditions of metastability and nonlinearity rather than in their elimination; this is a major shift in perspective. As I will suggest, the study of religion is enhanced by embracing the metastable (death is life, man is god) and nonlinear (the unpredictable outcome of historical interaction within communities) aspects of religions as central to the generative power of religion, than to reduce religion to offering “other-worldly” explanations that eliminate the impossible and the unpredictable. The shift leads to a very different account of religion and a different approach to the study of religion(s).

[several parag fromother bk] Another way of introducing these ideas that are movement based is in terms of the distinction of global and local made by Esther Thelen and Linda Smith in their study of child development.⁴⁰³ In the global perspective, as Thelen and Smith show, linearity tends to be largely adequate except for limiting concerns like beginnings and endings, yet in such a view reality is lawful to the point of being deterministic and excludes freedom and choice and novelty and individuality and difference. In the local view however an entirely different and distinct set of dynamics come into play where nonlinearity is possible admitting novelty, will, choice, freedom, and vitality. The copresence of global and local sounds quite fantastical, yet Thelen and Smith demonstrated it in their studies of early childhood development. Their work focused on the local view of development as it pertains to specific children. In this view they found that the issue was how freedom and novelty and choice are managed because there is an overabundance of it for any child at any time. This approach led to their development of coordination dynamics to account for the progression of development. At the global level they noted that researchers like Jean Piaget were able to set forth a very linear and deterministic progression of human development among children generally. One of

⁴⁰² Gill, Vitality (forthcoming)

⁴⁰³ Esther Thelen and Linda Smith, ????

the things I believe is so important about Thelen and Smith's work is that while the linear lawful deterministic global view is important, they show that it needs to be complemented with the local view where nonlinearity, a totally different kind of dynamics, is at play. It is only at what they call the local level that the energetics produced by freedom, novelty, chance, and the enfolding of the complex system upon itself can be discovered and appreciated. We need understand that these local and global views are copresent; they amount to metastability, seemingly in many respects opposed to one another, yet essential in their twining; essential to life.

Religion and the study of religion as appreciated by foregrounding the implications of metastability and nonlinearity will be concerned with how the anomalies, the *impossibilities* as I like to call them, the conflicts, the complexity, the organicity of religion and also of its study are key to a more sophisticated and satisfying account. Such a study of religion will focus on the "otherness," "the super-," the "supra," and so forth in terms of their unapologetic and openly proclaimed nonlinearity and metastability in order to comprehend how it is this very nonlinearity and metastability that correspond with movement and enable reflection and thought and innovation and application and ultimately generate the vitality that drives the ongoing tradition; religioning. Such a study of religion will focus on the metastability that characterizes story, myth, belief, ritual, *theos*, metaphor, language, art, prayer, and so on; an approach that would keep the religioning in the religion and the kinetics in the study of religion(s).

In his 2006 *Crossing and Dwelling: A Theory of Religion* Thomas Tweed's careful discussion of religion theory and the study of religion shows that by its etymology and definition theory is akin to travel and he discusses theory in terms of itinerary arriving at the notion that "theories, then, are *sightings* from sites."⁴⁰⁴ He supports the visualist nature of theory by tracing its etymology to its Greek roots. Theories, Tweed suggests, are like the scholar walking in the stacks of the library spying various books or sightseeing from a moving auto.

Tweed's own theory construction is one he says, "highlights movement and relationship."⁴⁰⁵ He does us great service by reviewing and accumulating a number of important philosophical resources that underlie movement based theories of religion and he offers examples of religion theorists that focus on movement. Tweed summarizes in a passage that reveals his understanding of movement as it relates to the construction of religion theory.

These interpretive categories—*network*, *system*, *movement*, *migrancy*, and *travel*—each have some advantages, and I use [Michel de] Certeau's *trajectory* as a synonym to point to religions' dynamism. I decided, however, that two other orienting metaphors are most useful for analyzing what religion is and what it does: spatial metaphors (*dwelling* and *crossing*) signal that religion is about finding a place and moving across space, and aquatic

⁴⁰⁴ Tweed, 13.

⁴⁰⁵ Tweed, 22.

metaphors (*confluences* and *flows*) signal that religions are not reified substances but complex processes.⁴⁰⁶

The question is, however, what is the understanding of “movement” that shapes and distinguishes these theories of religion and the studies they support? In the context of this chapter the question is “there’s movement and then there’s movement” so which movement shapes these theories of religion? Tweed’s choice of Certeau’s term “trajectory” and his own spatial and aquatic metaphors indicates that the movement envisioned is the retrograde movement that charts change on a grid of linear time and homogeneous space even if this change has hydraulic qualities. Tweed writes, “Whatever else religions do, they move across time and space. They are not static. And they have effects. They leave traces. They leave trails.”⁴⁰⁷ But so do monarch butterflies and penguins and geese and every other animate organism. What distinguishes the crossings and dwellings of the amoeba from those of the religious? Tweed offers, “Sacred flows cross space-time.”⁴⁰⁸ The suggestion is that the sacred (other, elsewhere) is also here; time and space distinguishing the human place. This is the fundamental metastability of the sacred (religious) in that it is there, but also here. The proposition, as I understand it, is that the sacred leaves its mark as the dwellings and crossings of space and time. To track these trajectories or itineraries is to discover the history of encounter and movement.

It is important to discern what movement, what understanding of movement, is engaged in such theories of religion because there is not much evidence that in finally becoming aware that religion(s) and movement are connected, movement is understood as anything other than in the linear backfilled retrograde sense. What about the copresence of the “there” and the “here” that is at the heart of the vitality and dynamics that are moving itself as well as the sacred presence in space and time? How does this living movement enter the theories of religion or even the kinesthetic movement aspect of the academic backfilling and gridifying and scaping? I contend at the outset that the difference among living movement and trajectory movement is not minor and it is fundamental. Thus I’d also argue that basing an account of religion on the dynamics of living moving will produce very different and more interesting results than those that are based on retrograde movement. In a very real sense this book is about this distinction focused on showing the implications for theories of religion constructed on the model of what Barbaras termed “living movement.”

While the discussion requires the full book to introduce, in the spirit of metastability and nonlinearity, yet to be fully explored, an adumbration of the results should start to vibrate here (something like humming a tune); even if that vibration may feel to some like an irritation.

Immediately we have to acknowledge that theories of religion based on living moving are those that not only allow but also emphasize copresence (metastability)

⁴⁰⁶ Tweed, *Crossing and Dwelling*, 59.

⁴⁰⁷ Tweed, 62.

⁴⁰⁸ Tweed, 64.

and nonlinearity. The immediate upshot of this shift is that core generators of the vital energy of religious traditions and communities are to be found in the oppositional, the conflicting, the differences, the chaotic, the paradoxical, the impossibles, the fantastical, the tragic, the persistently inexplicable, the confounding, the radical, the schisms, the violence, the suicides, and the theological debates. The life of religion(s), religioning, is to be found in the embracing of how these uneasy traits generate energy, are ontogenetic, even if also more often characterizable as strife, pain, conflict, war, violence, crises, schism, and questions rather than peace and tranquility and joy and centeredness. Such theories of religion have always to recognize that there is no peace except in the looming shadow of war and dead bodies, no joy except in the presence of drying tears and tragic events, no coherence apart from the persistent uneasy sense that nothing really fits. Such theories of religion are concerned with the dynamics by which such uneasy if not impossible pairings always amount to vital movement, the very movement that, when tracked across time and space scapes, can be academically reckoned (and thus given some meaning and explanation) as history or social movements or migrations or pilgrimages. Such accounts also acknowledge that religions in all their constituents—myth, ritual, tradition, belief, practice, community, theology—are human construction and as such were created in such ways that metastability and nonlinearity (impossible possibles) are foregrounded and crafted in such ways that endure, indeed, endure for generations even millennia. What I'm suggesting here is that despite all the apparent coherence and meaning (to use an academic word I no longer find of much use) of the academic view of movement from above (global view, autopsy), the generation of this movement (the local, the moving) is always characterized by metastability and nonlinearity because these are at the core of the generative dynamics (local view, kinetics, ontogenetics).

Our contemporary understandings of religion(s) tend to be shaped by a rather romantic expectation summarized most succinctly as "religion is good." When what we recognize as religions misbehave in terms of these expectations we are inclined to call them cults or movements (interesting); we insist that these apparent religious phenomena are not "true" religion or true to the specific religion; we radically otherize them to the point they are excluded. We "want" (maybe "need") religion to be identified with good, order, meaning, joy, happiness, centeredness, stability, coherence and as a result we tend to define religion(s) in these terms. Good religion also has ethical and moral implications. In his 2005 book *Between Heaven and Earth* Robert Orsi provides a thorough and insightful account of how our understanding of religion has come to be so strictly limited to the "good." He writes, "The true religion long established within American academic culture—what another historian calls a domesticated Christianity tailored 'for use in public life'—now became the 'religion' studied in the academy."⁴⁰⁹ According to Orsi's analysis,

⁴⁰⁹ Orsi, *Between Heaven and Earth*, 186. Orsi's other scholar is ???

“good religion” refers to religion “acceptable in belief and practice to this domesticated modern civic Protestantism.”⁴¹⁰

I recently watched an interview of a female Unitarian minister describing how her worship service was interrupted by a number of people posing as guests who revealed themselves to be religious anti-abortion advocates; apparently her church was friendly to those building a nearby women’s health clinic. With great pride she described how the youth in her congregation arose and joined hands to exclude these protestors and started singing “songs of love.” When asked about the intruders, she spoke very slowly clearly so as to carefully select her words in order, as I saw it, to project that her religious stance was good and loving despite the obvious deeply disruptive presence of these offending religious others. In order to retain the position that “religion is good” her criticism of these intruding and offending others was presented in terms of religious freedom, an American political principle. It appeared to me that she did not want to critically consider them in religious terms; to acknowledge that these offensive acts of protest were religious or religiously based would have been to compromise her inherent position that “religion is good.” The offensiveness of their actions was not religious but political.

Despite the obviousness that religions throughout history and across the world have been closely and constantly aligned with violence and oppression and discrimination, it is nearly impossible for Americans, including academics who study religion(s), to acknowledge that this is association is legitimately religious. Robert Orsi writes, “People want to be assured that the men who flew their planes into the World Trade Center on September 11, 2001, were not representatives of ‘real’ or ‘good’ Islam, or that the Christians gunning down abortion doctors do not reveal anything about contemporary American Christianity, or that priests abusing the children in their care cannot have anything to do with Catholicism.”⁴¹¹ On November 18, 1978, the American Academy of Religion was meeting in New Orleans during the murder and mass suicide of 918 people in Jonestown in Guyana. Despite the obvious religious aspects of the People’s Temple, the amassed body of religion scholars in New Orleans had little to say at the time. And with the exception of Jonathan Smith’s eventual article,⁴¹² the event was relegated to the language of “cult,” a term that equates with “bad religion.”

The assumption that “religion is good” reaches to more romantic levels in distinctly serving to “intensify joy and confront suffering” as Thomas Tweed’s definition indicates⁴¹³ or it offers comfort and clarity in a complex and confusing world. My students tend toward the view that religion answers questions, specifically those that seem to have answers nowhere else unavailable; that is the questions science can’t answer; echoing the widely held science versus religion disposition.

⁴¹⁰ Orsi 186.

⁴¹¹ Robert Orsi, *Between Heaven and Earth*, 179.

⁴¹² Jonathan Smith ... Jonestown article.

⁴¹³ Thomas Tweed, *Crossing and Dwelling*, ??

A major concern for the academic study of religion is how to avoid advancing the moral assumptions that seem invariably to accompany this complex situation: that *our* religion is good; that *their* religion must be bad or not true or not real simply because it is different. We see constant political and popular efforts to overcome this gesturally deeply held position, the romanticism of the “other” as criticism of “self,” the superficial universalism of all religions (“every religion welcomes refugees”), or an essentialism or perennialism (all religions are finally really the same by being based on love of fellow man and earth and god). Even here the implicit assumption is that to be recognized as religion it must exemplify “good.” Robert Orsi has shown the complexity of this issue and how difficult it is and will be to avoid in the study of religion.

It seems to be virtually impossible to study religion without attempting to distinguish between its good and bad expressions, without working to establish both a normative hierarchy of religious idioms (ascending from negative to positive, “primitive” to high, local to universal, infantile to mature, among other value-laden dichotomies familiar to the field) and a methodological justification for it. These resilient impulses take on special significance in light of the well-known inability of the field to agree on what religion is: we may not know what religion is but at least we can say with certainty what bad religion is or what religion surely is not. The mother of all religious dichotomies—us/them—has regularly been constituted as a moral distinction—good/bad religion.⁴¹⁴

Orsi’s discussion of the tacit assumptions that deeply shape the study of religion should be mandatory reading for all scholars in the field. His account of the religious constitution of the way religion is understood is disturbing. “‘Religion’ as it took shape in the academy was explicitly imagined in relation to these others and as a prophylactic against them.”⁴¹⁵ The “others” Orsi refers to are, as he describes them, “fire-baptized people, ghost dancers, frenzied preachers and gullible masses, Mormons and Roman Catholics.”

Against this historical background with its unspoken value assumptions, the study of the “other” in religion—which incidentally corresponds with the modern period in the academic study of religion beginning in the 1960s—already assumes an otherizing of them. From the values implicit to the study of religion, these “others” can be considered only in terms of how they amplify or clarify “good religion.” In the study of the religions of others there is often a bit of arrogance in the academic methods in the tacit assumption that the subjects studied are inadequately coherent in, sometimes even to, themselves and need the academic to reveal or bestow meaning on them. Yet, we have long acknowledged the presence of colonialism in such an approach.

An account of religion based on self-movement, on the dynamics of moving itself, is concerned with the ways in which religions construct complex metastabilities and

⁴¹⁴ Orsi, 183.

⁴¹⁵ Orsi, 186.

nonlinearities that are equivalent with the energetics of process. Such an account will be able even to consider the “religion is good” position in dynamic terms. As Orsi showed, much of what emerges in the concrete history of the “religion is good” idea is in response to what is assured to be “bad religion” rather than a firm and clear sense of what is “religion.” A movement-based account of religion will be concerned with how holding together the good and the bad create the metastability that actually generates the religious tradition and gives it the energy of movement.

Even when we explicitly indicate movement and relationship as central to our theories, as does Tweed among others, we tend to understand religion(s) and academics generally in terms of what Henri Bergson called the “retrograde movement of the true;”⁴¹⁶ the kind of movements aimed at stopping the moving (Bergson called them “halts”); this kind of truth after all stands still.

Living movement (Barbaras’s term) in contrast with retrograde movement is process, vitality as it is processing and vitalizing. From a philosophical perspective as developed by Renaud Barbaras, Brian Massumi, and others, living moving requires a self and other (a moving body in the context of an other/environment) that are at a distance (be it virtual rather than actual), yet joined by the force of movement. Self-moving is the virtual distance of “from-to” that is characterizable as desire, but not a fulfillable desire. Merleau-Ponty understood this copresence as the ultimate reality; I would prefer the more active term “vitality.”

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Living movement is at the core of neurobiology as we recognize that everything about animate organisms is about living movement. As we look to neurobiology for an account of movement, rather than some alternative and contrasting account, we find complementary and clarifying terms. We discover particularly in such areas as proprioception the neurobiological roots of perceiving and knowing. We discover in such areas as coordination dynamics, without which we would simply lurch about if we didn’t just self-destruct, that are pervasive throughout all animate organisms that metastability (the holding together of oppositions) and nonlinearity (the unpredictability of complex systems) are not problems to be resolved, but rather are at the heart of any account of freedom, choice, creativity, novelty, and certainly vitality in these most basic organic terms. In self-movement we find kinship with all animate organisms as well as ways of articulating those characteristics that distinguish us as human. And when the copresence of difference, even opposition, is essential to living movement, then perhaps we can move more gracefully beyond the “religion is good” limitation to see that the presence of even the “baddest” of behavior is ultimately a face of the generative force of the living religious tradition.

In the following chapters I will present and discuss a variety of philosophical and neurobiological studies that offer substantial inspiration and support for the development of an account of religion guided by movement, living moving, understood as copresence that we might better keep the religioning in religion and the potential for advancing knowledge, the excitement, in the study of religion. I will also show that even the retrograde movement of halts that characterizes the

⁴¹⁶ Henri Bergson, *The Creative Mind*, (New York: Philosophy Library, 1946), 9.

academy is nonetheless movement and also can be characterized in some respects as living movement. We must not place movement against movement without also seeing that living movement and retrograde movement are themselves necessarily copresent. The study of religion(s) must be recognized to be potentially as creative and life-generative as is religion. Otherwise, why would we be doing it?

Movement & Religion/Religions

There are all sorts of possibilities for considering religion and the study of religion(s) in terms of the movement implications of neurobiology, especially coordination dynamics. At the simplest level one could see that religions are shot through with what I am fond of referring to as “impossibles.” Indeed, it seems to me that the forte of religions is the unapologetic proclamation of impossibles: god is man, death is life (even eternal life), wine is blood, bread is flesh. Ritual trades in proclaiming something is what we all know it isn’t. The distinction of myth is that its setting and characters are not of this world, yet the importance of myth is centered in its statements about this world. Belief is saying that something is what we’re pretty sure it isn’t yet have no way of knowing. Love is to proclaim a oneness where there is always a twoness. Faith is to act as if we know when we know that we don’t know. What I am suggesting is that rather than the study of religion(s) finding their mandate in the explanation of some linearity of these signature religious traits, it is to embrace and appreciate the energizing dynamics of nonlinearity.

At another level, scholars studying coordination dynamics recognize that their findings pertain to any complex self-coordinating system and they propose that we might consider such things as cultures and religions from this perspective. While I think this entirely possible and very promising, I think that it would take a team of trained scholars to even begin to think about how to do such a project.

For me, at this point, it is enough to recognize that to comprehend even in elementary ways the dynamics of neurobiology closely parallel and vastly enrich our philosophical understanding of the play of living movement, even the play among living movement and retrograde movement of halts. In philosophical neurobiological terms we can see that movement is a fundamental metastability that demands the distinction of self and other, animate organism and environment. Comprehending that movement creates experience in connection with environment that literally constructs and organizes the nervous system, affords us a major appreciation of the importance of experience, of acting in the world, of living in connection with the environment. What we do, how we live, where we live, what connections we have with the environment coexist with brain plasticity and with neurological functioning (neuron group formation and reentrant coordinations). This understanding of movement reveals its incorporeality as well as its corporeality; its transcendence as well as its immanence. Movement is characterized both philosophically and neurobiologically as metastable and nonlinear. It is particularly coordination dynamics that reveal to us that these movement characteristics are the source of the force and vitality of movement.

Based on the philosophical neurobiology of movement, otherness is an essential aspect of human movement; transcendence or the transcendent is essential to vitality. Remarkably this other is present to human awareness, an awareness that seeks some articulation of otherness shaped by culture and history in the human imagination. Navajos refer to the *diyin dine'e* as beings of the “other side”; some are acknowledged as being the “inner forms” that animate aspects of Navajo reality. Hopi consider the *kachinas* to live in the *kachina* world (vaguely below the human world) half the year. When present in the Hopi world the *kachinas* are clearly distinct as colorful dancing singing beings of great varieties. They are identified with rain clouds and with ancestors; both bringers of life. Christians identify the domain of God as Heaven— “my Father who art in Heaven”—and they say that Jesus “arose from the grave.” And so on this structurality involving other is distinctive to what we identify as religions wherever and whenever encountered. It is this very “otherness” that marks what we are gesturally conditioned to so easily and without contest identify as “religion.” While I very much oppose the idea that all religions or cultures are the same or that “in essence” we are all the same; while I believe that difference is the more interesting and important; I still believe that any account of religion cannot advance without including the traits that we tacitly agree distinguish what we term “religion.”

I think it is difficult to comprehend religion apart from some inclusion of an otherness. The approach I am presenting in this chapter (and book) is that we can glimpse something of this otherness through philosophical and neurobiological analyses of movement, particularly human self-movement. It is appropriate that religion finds its distinctiveness in vitalizing metastabilities—the copresence of self and other, of here and there—and to articulate them in the largest imaginable and most radical terms—impossibles; each religion distinguished by specific historical and cultural articulations that the effects of coherence- and life-generating dynamics endure.

Religion & Gesture

[have a whole chapter on this in Always Already ms. ???]

Inner Touch: Proprioception

[from other ms] Religion everywhere is practice and action and repetition and formula and all those many constituents we clump together and call tradition or community or organization. Religions are identified as much by what their adherents do and how and when and where they do them as by statements of doctrine or belief or principle. We often presume there is continuity among doctrine and practice; yet this assumption may often be a stretch. The great bulk of religious people could not with much acumen state doctrine or belief in intellectual terms, but they can, with great precision, recite creeds and prayers and mantras and they can sing songs and dance dances and perform rituals and tell stories. In my experience these primary movings are done with the utmost care based on patterns that identify them with tradition and coherence. There are often complex critical methods to assure the proper performance of these religious actions. I've found this

in many of the religious communities I've been involved with. Navajos often acquire a second "singer" or medicine person to oversee and assure the accuracy of a performing singer. Some adherents of some religions take the more reflective and esoteric approach by writing and arguing doctrine and principle and theology, but they are the few. This too is action encounter practice formed by tradition and training and driven by the felt satisfaction of the coherence, if but briefly experienced.

Importantly from the neurobiological perspective including proprioception we must appreciate that these forms of being religious—the daily doers of religious acts and the reflective thinkers and writers of religion—amount principally to differing styles and we must see that they both engage in similar processes based in touching/moving playing the fundamental role in constructing experience (now and accumulating) that forms religious identity deep within the body's tissues as well as in the skillful postural gestural repetitive acts of living the religious life. Both of these styles are essential to many religions and yet the modern academic study of religion, being formed by academic postures and gestures as well as those of modern Protestant Christian theological ones, has tended to seek (or perhaps recognize) primarily the gesturally-posturally compatible religious styles—readings and writings—and to be somewhat baffled by (or often simply do not see) incompatible religious gestures and postures like dancing and ritual and art and practice.

In this distinction of styles I'm reminded of Balinese rituals I've attended. A cremation rite I attended is particularly illustrative. In the family compound where the ritual processes began, there were pavilions completely filled with elaborate offerings whose construction had occupied the women for days. In another pavilion sat the instruments of the gamelan that would later be played by the men. On a temporary platform perhaps ten feet high erected on the side of the main courtyard sat a priest who chanted and read from palm leaf documents; he made offerings and performed a range of other official-looking actions. A young man would climb up and down the ladder to the platform in service to his needs. By and large no one paid any attention to the priest, yet I'm sure they knew he was there and that what he was doing was essential. A group of women were energetically involved in a discussion of the elaborate ritual process that would take place first in the home compound and then process a mile or so away to the cemetery, ending with the cremation. I was fascinated that they would discuss what to do for some time; the women would seem to come to agreement on how to proceed and then they would organize and initiate the action. Yet, often one of the women would raise her voice in protest. Further discussion ensued until agreement was again attained and the ritual process would continue.

Balinese daily life unfolds in the highly repetitious performance of actions. There is nothing in Balinese life that is not accompanied by if not actually performed by actions that are posturally and gesturally specific and these are repeated seemingly endlessly. While all of these acts are clearly set by tradition, they are flexible and negotiable to suit the exigencies presented. The extent of repetition is remarkable,

yet it is fluid and includes broad potential for creative variation. The Balinese are like well-trained experienced musicians that specialize in improvisation. The Balinese seem also to acknowledge the importance of the two aspects of movement I have considered. One is the doing of ritual with full attention given to the process, to the felt experience, to sensation, to the singing and dancing and offering and walking and burning and everything “ing.” The other is represented by the priest and perhaps also by frequent discussions of procedure. Yet even these retrograde movements are posturally and gesturally distinguished; these too are experiential and comprise tradition and action and experience.

Emerging from this inquiry into movement and play via both philosophical and neurobiological systems is a quite remarkable proposition, which is that the concepts, defining characteristics, beliefs, memories, patterns by which we know religion are all acquired by and comprised of the accumulating history of repeating self-movement and that these patterns reside in the body as skills for the ongoing movement that is engaged as perceiving, knowing, and acting in the world. The proposition is that the moving body comprises us, even conceptually. The possibility of any concept, idea, belief, doctrine that does not ultimately originate in living movement is, I suggest, rather slim. Self-movement informed by culture, history, and psychology is shaped into gesture and posture that correspond with concept, memory, history, skilled behavior. Proprioception is essential to this self-moving process. Proprioception is how sensation is interconnected in the substantive ways of specific posture, gesture, and concept with the remarkable details that comprise culture, history, and psychology.

There is an important parallel between self-movement and proprioception; or perhaps proprioception, as inner touch, is a neurobiological way of comprehending deeper dimensions of self-movement. Like movement, proprioception establishes a copresence of other, that which is beyond “me,” and self, that which I feel is “me” or “mine.” Proprioception as self-movement is transcendent in that it engages us beyond ourselves. Proprioception is the “self” in self-movement. And powerfully, as Massumi introduced, proprioception invokes an incorporeality that is thoroughly biological. Our very experience of life is an experience, a corporeal experience, of an incorporeal other.

It would seem then that proprioception offers insight into the development of materialist theories of religion; yet, all religious experience is necessarily materialist in that experience is corporeal. Certainly proprioception is engaged in the encounter with environment, with the material world in which we move. While, as Main de Biran indicated in the early years of the 19th century, movement itself without encountering a material environment is nonetheless experienced,⁴¹⁷ the bulk of proprioception is the moving/touching encounter of self and material other. Proprioception shows that it is in the moving/touching encounter rather than sheer materiality that the qualities of matter relevant to human vitality even exist. The

⁴¹⁷ See Heller-Roazin for discussion.

material world occurs in its significance to us through relationship to the distinctive perceptual/epistemological faculties that distinguish us.

As Manuel Vasquez so ably shows, materialist theories of religion are distinct in including practice and behavior and body and territory and sensation and actions like dancing and singing. Yet, materialist theories are distinguished over against those that identify religion with the ineffable the mysterious the special encounter with some radical other. Materialist theories are commonly distinguished over against those that focus predominantly on texts and religious language. I completely agree that materialist theories of religion broaden the study of religion. Based on the discussion of proprioception I propose that all of religion can be understood in the moving/touching terms of proprioception, rather than the marked distinction between those that are materialist or bodied versus those that are textual or theological. Even the most “mystical” and “esoteric” aspects of religion simply cannot be even acknowledged, much less identified as “experience,” without grounding in the terms of proprioception, moving/touching. Religion is always already comprised of the moving body.

This proposition applies both to religions and to studies of religion(s). The Arrernte in Central Australia engage in subincision, nail and tooth extraction, dancing, singing, trekking long distances in harsh landscapes, extensive costuming often involving the use of human blood as a bonding agent to apply puffs of plant material in patterns all over the skin. Interestingly, among the early classic ethnographers of these cultures only perhaps Geza Roheim ever gave a much attention to these proprioceptively and sensory intensive experiential elements of Arrernte religion and, for his efforts, he was typically ignored and dismissed, partly because of his Freudian bent. At most classic ethnographers “explained” the “meaning” of these ferociously sensory elements in cultural terms; gave sanitizing halts that removed the rawness of the sensation; a rawness that any observer could surely not be profoundly moved by. The events at the historical core of the Christian tradition involved bloody sacrifice, torture, murder, and a communal meal with cannibalistic (or whatever is the term for eating one’s god) implications. The various divisions within the Christian tradition can often be identified in terms of their response to these ferociously sensory elements; responses that give halt to the rawness of the sensations that one would surely experience as the most moving. And a quick browsing of Walter Capps’s *Religious Studies: The Making of a Discipline* (19??) reveals that the academic study of religion arose out of a tradition of European Christian sedentary thinking reading writing men whose touching experiences were limited to their fingers on pen and paper and their derriere’s on chairs and pews. I suggest that there is a strong correlation between the characteristic proprioceptive signature of action and lifestyle and the character of experience as well as conception/cognition that is even possible. The gestural/postural patternings that are inseparable from proprioception are powerful forces that form the content of sensation and perception and cognition.

In the examples I’ve given above there is a proprioceptive dimension of transduction. To begin with highly active moving/touching sensory experience as

one's subject, to comprehend this in the context of a lifestyle shaped by the isolation and desk bondage of academia and the habitus of modern intellectual Christians requires a transduction of a considerable magnitude. If we grasp how important is proprioception to the formation of corporeal concepts—indeed, all conception is grounded in some ways on these corporeal concepts—then we can begin to appreciate how necessarily reductive are most studies of religion simply because of the magnitude of the required transduction.

From the outset of this book living movement is understood as the copresence of here and there, self and other, moving body and environment. The there, the other, the environment are essential characteristic of living movement. We are born moving in an environment, as proprioceptive selves in a material world. Moving can only be movement in environment, in the context of "other." The implication is that the material world is shaped through the living movement of animate organisms. This shaping is not simply in the human manufacture of material objects (which Elaine Scarry showed in *Body in Pain* are inevitably projections of the human body), but also the given world shaped by our faculties of perceiving and knowing that are dependent on living movement. Any rich account of religion(s) must, I would suggest, include the implications and insights gained by exploring proprioception; that religion is always already the moving touching, that is the proprioceptive, body.

Experience

Though Ann Taves indicates her 2009 book, *Religious Experience Reconsidered: A Building-Block Approach to the Study of Religion and Other Special Things...*, is about experience, it is actually about the processes of the attribution of some event constructed from remembered experience as "special" and thus in her reckoning "religious." Indeed, she says the more special the more likely "religious." Experience for Taves is only "thing," that is the object of attribution, of deeming. The difficulty with this limitation for me is that this approach does not acknowledge the experiencing of experiences; it does not acknowledge that experience is inseparable from movement; it does not recognize that experience is always also feeling; it does not recognize that experience, as shaper of synaptic criteria, is the ultimate basis for concept, image, idea, memory, and identity. Deeming has comparatively little to do with the self-moving feeling experiencing body. So the dynamics, the bodied processes that are felt, that are experienced, that are known by it being bodied/experienced are nullified or ignored in this most basic sense of the term experience when considered only as some thing that comes into existence as the result of deeming attribution (conscious or not). So it is actually attribution, not experience, that, in Taves' work as I understand it, is the focal concern. Certainly attribution has an experiential aspect, yet it is a different, at best secondary, aspect of religious experience. The seeming necessity of focusing on deeming rather than on the experience suggests shortcomings of the present academic methods.

It is perhaps no surprise that I am not a fan of identifying "religious" with the "special" which is a generic term incorporating other terms Taves frequently lists including mystical, spiritual, magical. I do acknowledge that when push comes to shove something of the

nature of “other” is likely necessary to distinguish religion among other cultural forms; indeed, much of this book is concerned with how we understand anew, or at least freshly, the presence and importance of this other. Yet, “other” is categorically different from “special” because it denotes the “impossibles” that invoke metastabilities and nonlinearities. To me, “special” has a rather different connotation. Of course, we’d all draw some association between the terms mystical and spiritual and the religious (likely because we are gesturally conditioned to do so), yet, to understand religion, more specifically religious experience, as comprised of and limited to the special is, in my experience, to miss pretty near everything I and all those I’ve ever been around that I’d consider religious would consider religious. I found it remarkably refreshing years ago when Jonathan Smith allowed that we have a choice between seeing religion in Taves’ terms as limited to the “special” or as what happens and is experienced “every day.”⁴¹⁸ Certainly every religious community that I have ever been around would find simply dumbfounding questions like “so how is it that you have come to deem this experience as special?” Religious experience is inseparable from the feelings one has associated with all too quotidian repetitious actions done in the streets and fields and homes. Indeed it is the feeling of familiarity and habit, community and tradition and thus anything but special. These movings/experiencings that the religious folks I know would consider religious are inseparable from who folks are and how they live and these movings/experiencings are inseparable from their very character, community, history, identity. To think of religious as somehow limited to the “special” in the sense synonymous with mystical, magical, spiritual, would be to think of water as special in some “wow” sense; for many both religion and water are daily life essentials. Indeed, in my experience, the sorts of experiences that religion scholars term “special” are often avoided, feared, denied by religious folks. The Balinese very reluctantly accept the role of dancing with Rangda who will entrance them. Can we confine Balinese religion to these trance dances or “special experiences” when anyone who has ever been to Bali has observed almost constant ritual practice of the sort so common as to be unnoticed? I doubt that in Bali even rice farming is engaged in more than Balinese ritual practice; and indeed there are many aspects of rice farming that are ritually based. The Yaqui fear ritually presenting a Chapayeka because of the potential this masked ritual action has to cause them to become evil; even though the presentation of evil is ritually essential. Yet, surely we cannot confine Yaqui religion to these occasional actions that are associated with experiences deemed “special.” Navajo singers often repeatedly deny their potential for power and yet Navajo healing rites are as common as going to church on Sunday mornings. And speaking of Sunday mornings, my grandmother lived to the age of 94. She attended church every Sunday and was involved with her church community her entire life. I well remember as a youth sitting beside her on the hard pew hearing her reedy voice rise in the refrain to the hymn “Holy Holy Holy.” Her funeral was in that church. Yet, I am certain that never once in her life did she think of her religious life as anything at all special. I am sure that she never imagined or desired anything like a mystical experience; she likely wouldn’t have even comprehended such a thing. She was a quintessential example of “salt of the earth” as described by Jesus in the Sermon on the Mount (Matthew 5:13). So in the absence of anything she or anyone else in her church community would “deem special” do we proclaim that she and all those like her are not

⁴¹⁸ Smith ... religion is everyday.

religious, or perhaps not religiously interesting to religion scholars? Yet, we can see that the regularity, the movement, the practice, the habituated skilled actions shaped the synaptic criteria that gave coherence to belief, concept, and religious identity. And the priest of the novel that has inspired this discussion is religiously important to me not because he has some special moment or experience or anything he deems special that anchors his religion. Rather what I find so remarkably interesting religiously is that even though he is never able to experience anything special, receive any clear evidence of God's plan for him, he none the less continues to pursue a life of practice and habit and inquiry. And, I suppose there is a bit of irony here in that the priest, like the ultimate missionary, traveled to visit people on a distant planet!

I do not intend to discourage enterprises such as Taves' reconsideration of attribution processes or even of the focus on that miniscule portion of all religious experience that can be identified somehow as "special," yet for me these things are of little interest, something I simply don't have time for (any longer anyway) when to even use the term "mystical experience" seems at once to name an impossible and yet I can't help but think that a pursuit of the impossibilities of it, if we do so concerned with how it engenders movement and life, leads us to more fully appreciate something quite human (and, if we insist, also religious). Of mystics we should ask how is it that we can completely extend beyond the reality of our own finitude and yet know this by means of our finite bodies—well yes comprised of our miraculous neurobiology. Now such concerns as these are interesting to me. I don't much care how we attribute "specialness" to anything, because for me clearly the most common neuron is beyond special in the miracle of its architecture; every neuron is constructed to reach out to touch and be touched, to connect, to transcend its boundaries, to give genesis and force and direction to movement.

Body

Metaphor

In his 2002 book *Metaphor*⁴¹⁹ Zoltán Kövecses defines metaphor, or specifically "conceptual metaphor," as "understanding one conceptual domain in terms of another conceptual domain."⁴²⁰ He explains that metaphor is a process of mapping entailments from the more concrete to the more abstract and that the process is unidirectional.⁴²¹ In his example, a commonly used one, LOVE IS A JOURNEY, he holds that journey is the more concrete term and that its entailments are mapped onto the more abstract term, love. The travelers are mapped as the lovers; the vehicle is the love relationship itself; the distance traveled on the physical journey is mapped as the progress made in the love relationship; and so on. The importance of showing these characteristics of metaphor is that we soon begin to appreciate that our lives and our language are shot through with metaphors. The

⁴¹⁹ Zoltán Kövecses, *Metaphor: A Practical Introduction* (New York: Oxford University Press, 2002).

⁴²⁰ Kövecses, p. 4.

⁴²¹ Ibid., p. 6.

now-classic 1980 book of George Lakoff and Mark Johnson, *Metaphors We Live By*, shocked many of us in making this point so decisively. We can scarcely come up with a single simple statement that isn't based in some key metaphor and we cannot find any concept or experience that we would hope to talk or think about free of metaphor. Minimally an appreciation of metaphor at even a general level is an awakening. We must recognize that concepts, in contrast with our general sense that they are things only of the mind and acquired somehow by the mind, are actually based in experience. Thus concept acquisition and use, thought as well, need be reconsidered in terms of the revelations gained in the deeper understanding of metaphor.

The structurality of metaphor, how it serves to advance our knowing, is my concern here; I have not found that the extant discussions of metaphor have yet benefitted from an engagement with the philosophical or neurobiological findings related to self-movement. I am fond of the simple definition that extends Kövecses' definition in just one respect; metaphor is to understand one thing in terms of an other thing, which *it is not*.⁴²² The convention for stating a metaphor is to use capital letters and the joining word *is*, for example, LOVE IS JOURNEY. In Kövecses' example, "love" is the target and "journey" is the source, which means that he understands that "journey" is concrete and "love" is abstract. When I read his list of entailments and mappings, I think that a revision to his presentation is necessary. The word "love" names an emotion or a feeling and I believe that all the attributes of "love" that Kövecses names refer to something other than "love." Rather they refer to a "relationship" and, indeed, all of the features that he assigns to "love" have little, if anything so far as I can discern, to do with any emotion: the lovers, the relationship, the events of the relationship, the progress made, continuing on to the goals of the relationship. So first of all, it seems to me that there is a hidden element in this particular metaphor and it is actually "love" itself. And perhaps the hidden love in this metaphor represents something rather larger in the structurality of metaphor and that is "feeling" or "emotion." We know that love or feelings or emotions usually drive a relationship, but we are distracted from this hidden, yet most important, element in the double structure of metaphor. These comments may seem to be quibbling, but they make an important point; metaphor is not unidirectional. Were I not to already know love, apart from the LOVE IS JOURNEY metaphor, then I could not evaluate the mapping. Based on the perspectives I've been developing throughout this book, metaphor is metastable, it is holding two things that are not equal as equal with the effect being an energizing playful exchange among the members of the pair, not to resolve the distinction or to relieve the copresence, but rather to recognize that the vitality of the terms are revealed through metaphor structurality. Metaphors are not engaged, as are analogies, in the formal acquisition of concept only then to be put aside because their work is done. Metaphors persist I would suggest because it is their very metastability that continually energizes the potential of the metaphor.

The unidirectional principle of metaphor is worth thinking about a bit more. It seems a standard and defining feature of metaphor theory and it is questioned by the approach I am proposing. LOVE IS JOURNEY, yet JOURNEY IS NOT LOVE. The target is considered

⁴²² Kövecses, nor do other students of metaphor, does not place any concern with the "which it is not" aspect of metaphor, although Lakoff and Johnson do talk about metaphors hiding as well as revealing.

abstract, that is, love as conceptual or emotional, while the source is considered to be concrete, that is, journey is a physical act as in a road trip. I want to contest these assignments, but first, were we to consider unidirectionality in terms of the related metaphor, one I think is the more accurate statement, RELATIONSHIP IS JOURNEY the direction of mapping would be less clear, because the inverse JOURNEY IS RELATIONSHIP isn't actually all that implausible. We might think of a journey as a relationship of the traveler through space relating to the road, to the landscape, to the map, to fellow travelers, and so on. I'm convinced that the power and effectiveness of metaphorical mappings, rather than being in its unidirectionality, is in the oscillatory comparative movement between the terms; in the metastability that is essential to what distinguishes metaphor, the copresence of "is" and "is not." The two terms must be reversible to some extent, yet simply incomplete in their reversibility. To understand metaphor in term of the implications of self-movement, especially the notion of copresence, I believe offers an important advancement.

In metaphor an essential condition is ONE THING IS ANOTHER THING. The word "is" is a marker of copresence and reversibility. Were it truly unidirectional the conventional presentation would be ONE THING←ANOTHER THING, using a left pointing arrow to indicate the mapping of the source domain named second onto the target domain named first. "Is" means they are equal, yet different, and thus, in some respects, reversible. Yet, mappings of entailments cannot occur without some oscillatory negotiative reversal. The point here is that one cannot correlate map to territory without in some sense already knowing both. Mapping, if not random which surely isn't mapping at all, is then transduction, the correlation of something from one form it may take to another quite different form. However, another essential condition of metaphor is that the "one thing" is also *not* the "other thing;" this is the most essential characteristic of metaphor but it is usually left silent. Were this silent condition not so, then the metaphor would be LOVE IS LOVE and who could learn much of anything from that one? A rose is a rose? The essential structurality for metaphor I am suggesting should be familiar by now. It is based on the same structurality as is movement and play; it is the metastability fundamental to neurobiology and to perception.

Typically the two terms of metaphor are distinguished in terms of the concrete abstract distinction. Traditionally the distinction between concrete and abstract has to do with specificity. Love is abstract, while my love of chocolate is concrete or at least more so. But then journey is abstract as well, while my journey to the market is concrete or at least more so. While it may at first seem that the source domain is the physically experienced while the abstract is the conceptual or categorical, I suspect that this view is based on a backfilled or retrograde view of metaphor that presupposes a distinction between experience and concept; I do not believe this can be sustained under scrutiny. A major function of metaphor is the construction of concept; indeed, Lakoff and Johnson say that metaphor is preconceptual, a position I think goes too far; surely metaphor and concept arise in the same interrelational process.

If we understand knowing as, in some sense, the accumulation of experience, then the labels for these generalizing patterns of experience may be considered referring to concepts or categories. These concepts and categories are constructed in the ongoing

comparative processes of engaging the “now” experience with the accumulation of all related experiences in the ongoing formation of patterns that reflect the experienced coherence of all related experiences. I’d hold that it is simply impossible that the metaphoric process is a one-directional mapping process; but rather, as Lakoff and Johnson so convincingly showed, it is among the most powerful quotidian methods of knowing.

There remains the issue of how to adequately distinguish between source and target terms in metaphor. I find it valuable to review Kövecses’ lists of common categories for source and target domains in metaphor and the way we have tended to distinguish the lists. Body, health and illness, animals, plants, buildings and constructions, machines and tools, games and sports, money and economic terms are the categories common to the source domain, while emotion, desire, morality, thought, society/nation, politics, economy, human relationships, communication, time, religion, and so on are categories common to the target domain. As I have suggested, a little reflection suggests that the concrete/abstract distinction doesn’t really hold; indeed, I think it betrays hidden assumptions that obscure rather than clarify. We might be tempted to hold that the source is more physical while the abstract is more mental, yet this distinction doesn’t survive careful scrutiny. For example, game may seem more physical (thus concrete) while religion is more mental (thus abstract), but game theorists and religious practitioners would put the lie to these conclusions.

We might simply hold to the notion that the principal distinction is simply “source” versus “target,” yet that would support the unidirectionality of the mapping. Approaching something more satisfying is to distinguish the terms as primary and secondary, which may allow the tipping of intention toward one term while allowing that there are impacts on the second term as well. One term may initiate the metaphoric linking of terms, but the energy generated by the linkage oscillates among them impacting both.

Metaphor, as a trope,⁴²³ is of a different order than perception, yet complementary to it. Metaphor is a language act or a conceptual act, yet, like perception it still functions, in naïve terms, to render experience coherent. And, like perception, metaphor is thoroughly experiential. Metaphor is not unidirectional so much as it is, in Merleau-Ponty’s terms, an incomplete reversibility. The incompleteness of the reversibility of the metaphor is the “not” to the “is.” And the “not” typically remains hidden. The description of metaphor LOVE IS JOURNEY emphasizes the “is.” However, of actually greater importance is the hidden certainty that LOVE IS NOT JOURNEY. The reversibility implied by the “is” is known to be incomplete, indeed, false, but only by the hidden and unstated “not.” In Merleau-Ponty’s terms this hidden “not,” this incompleteness in the reversibility, is the chiasm, the crossing place between the two terms of the metaphor, the crossing place where comparison, negotiation, revelation, expansion, construction, creation, thought, and action occur. It is the hidden “not” that gives movement and power and life and heuristic as well as communicative value to metaphor.

⁴²³ “Trope” is a word or phrase, expression, or image that is used in a figurative way, usually for rhetorical effect. However, interestingly, in medieval religious texts a trope was a phrase or text interpolated into the service of the Mass, suggesting that it was a kind of intrusion of the outside to the inside in order to expand or provide affordance.

Metaphor as a linguistic and cognitive act then succeeds perception in a logical sense and depends on it, yet metaphor is in continuity with flesh and this suggests that the linguistic cognitive aspect of metaphor is but one arc of its structurality. It suggests that metaphor is formative, heuristic, provocative, constructive; in a word, gestural. I'll take this aspect up again when I discuss gesture below. The thickness or depth of metaphor is dependent on a primordial "pure depth," the copresence of "is" and "is not."

Metaphor, I think, is much more a comparative operation of an ongoing nature that gains its energy and power from its structural metastability, its holding both terms as copresent, in order to generate an oscillating play that continually enriches and refines knowledge. That knowledge is resident in the synaptic criteria maintained by reentrant neurobiological processes shaped by the repetition of experiences over time. My proposed understanding of metaphor has similarities to Fauconnier and Turner notion of "blending" as fundamental to thought. I'll consider this more fully below.

Corporeal Concepts and Category Formation

In *Women, Fire, and Dangerous Things*⁴²⁴ George Lakoff argues for an experientialist base for thought grounded in the givenness of being moving bodies, animate organisms. Simply because we are human bodies, he argues, our preconceptual experience takes at least two kinds of structuralities, basic-level categories and kinesthetic image-schematic structurality. In the *Primacy of Movement*, Maxine Sheets-Johnstone argues convincingly for "corporeal concepts," foundational concepts acquired early in life through groping movements and throughout life based on patterned movement that underlies all knowledge. These body concepts structure our experience in ways based on the distinctiveness of the human body. We could then say that these concept-constructing processes are natural, of our bodied nature. Valuable implications include the continuity of human bodies with bodies of other animate organisms, both to support continuity and distinctiveness. Another implication is that culture, history, gender, and individuality also shape these body concepts. All concepts are based on such corporeal conceptual processes and to comprehend the importance of this position has implications for our account of religion and our studies of religion(s).

Lakoff continues by indicating that there are two ways in which "abstract conceptual structure arises" from these two structurings. One is by metaphoric projection from the domain of the physical to that of the abstract; the other is by projection from basic-level categories to superordinate and subordinate categories. My consideration of the structurality of metaphor, as summarized above, led me to question that metaphor is a unidirectional projection from the concrete to the abstract and it also has led me to question Lakoff's notion that metaphor is preconceptual. Lakoff uses the verb "arises" to indicate the temporal and value interrelationship between basic-level and kinesthetic image-schematic structures and abstract concepts. Applying his own well-known style of

⁴²⁴ George Lakoff, *Women, Fire, and Dangerous Things: What Categories Reveal About the Mind* (Chicago: University of Chicago Press, 1989).

analysis, the word “arise” is based on the up-down kinesthetic image schema and invokes the metaphor UP IS BETTER. It designates a temporal relationship that would indicate that abstract concepts come after natural body structures, but that the abstract concepts are somehow “better” or “higher.” The temporal ordering is, I believe, in service to arguing that body is more basic, more natural, than mind and that the mind cannot function without the body. However, there is in the word “arise” a bit of a residual of the old body-mind separation, the Humpty Principle, and the traditional hierarchy that values mind above body. There is also the residual of the necessity of linearity; a direct cause and effect relationship. I find it difficult to even grasp this temporal and unidirectional projection. If metaphor mapping is unidirectional, then what can be the object on which the entailments of the source are projected? Doesn’t there need be something there, something that has some independently discernible characteristics to receive these unidirectional projections? How do these so-called abstract concepts gain these pre-projection characteristics if not by bodily experience? I don’t think these questions can have adequate answers under Lakoff’s projection scenario. Therefore I don’t think it is possible to maintain that there can be mappings from a physical to an abstract domain. These problems raise for me questions about the basic term “abstract conceptual structure.” The word “abstract,” as it might apply in this situation, would mean something like a general concept without a specific example or a category apart from case, or it might mean an existent only of the mind and thus separate from body experience, or it might mean ideal or general rather than specific, or something that does not represent external/experiential reality. The word “concept” by indicating an abstract or general idea inferred or derived from specific instances is then in some senses redundant with the word “abstract.” It seems that the principal distinction of “abstract concept” must be its independence from body. When I think through all the implications of this term, it seems to me that if there is no concept existing prior to the metaphoric projection of entailments, then there can be no reversibility, no sense of the fit of metaphoric mapping, no choices made among which entailments of the source term are appropriate. The projection cannot be “on” to any target at all; it can only be a transformation into another form. The result would be that the so-called “abstract concept” could then only be a reorganization of the source term.

But what of the second way Lakoff describes how “abstract concepts arise”? This is the projection from basic-level categories to superordinate and subordinate categories. This is the process by which we move from the basic-level category, chair for example, to the superordinate category, furniture for example, or to the subordinate category, say rocking chair. Basic-level categories, Lakoff argues, are the first level to be acquired by children and they are “directly meaningful.” So too with kinesthetic image-schemas which are those structuring schemas that come directly from our human bodies such as containers, paths, links, forces, and orientations such as front-back, part-whole, center-periphery. The question is, in part, is the superordinate category “furniture” based any less on body and experience than the basic-level category “chair”? Does the category “rocking chair” come from a projection of the bodily experience of chair in some way that suggests an abstraction to any degree greater than chair? Again the term “projection” suggests a

unidirectional process and I simply can't comprehend how this is possible and, were it to occur, how the result can be somehow free of bodily experience.⁴²⁵

Let's take stock a bit. Maxine Sheets-Johnstone offered "corporeal concepts" as foundational to human discovery of self and world. Mark Johnson, relying on work done with George Lakoff, developed this idea in the terms of "image schemas." Image schemas seem to be processes and relational, akin to verbs. Lakoff, more focused on categories, developed the notion of "basic level categories" relying on a history of the concept that stems from the middle of the twentieth century. This construct complements the "image schemas" by being more like nouns. What is constantly present in Lakoff's discussion of "basic level categories" is that they arise from and are based in movement patternings, that is, the development of sensorimotor programs, or we might appropriately refer to them as gestures. This reveals the movement, relational, active, bodily, neurophysiological grounding of categories; and that is a major revelation. It is consistent with André Leroi-Gourhan's study of ancient tools focused on gestural patterns of their use. For example the basic level category "chair" is bodily grounded in the gestural pattern of sitting. Notice that the higher level category "furniture" does not have a single gestural pattern associated with it, but a variety and composite of gestures and would thus, necessarily it would seem, arise at a later stage. Also lower level categories such as "kitchen chair" or "bean bag chair" are connected with the general gestural program "sitting" yet have refinements or sub-programs that allow the subset distinction. Importantly it is the fundamental gesture rather than traits of the object that determines its identity for us. For example, an exercise ball is a chair when one performs the gestural action of sitting on it. Thus, there is strong evidence that basic level categories which are foundational to the way we understand ourselves and our environment are based at once necessarily on both the distinctiveness of the human body (its distinctive neurophysiology) and also on movement/gestural/touch interactional experiential processes.

Continuing our stock taking, because basic level categories are grounded in human experience, the implications for category theory are deeply significant. The establishment of basic level categories serves to undermine classical category theory grounded on the notion that reality exists independent of human perception and conception shaped in itself in the terms we grasp as categories and distinctions. Grasping basic level categories demands the revision of category theory.

A major aspect of the development of category theory is the awareness that basic level categories are shaped on gradients of characteristics that correlate with experience. While all human bodies have closely similar neurophysiology, clearly not all human experience is

⁴²⁵ Lakoff describes the various operations of what he terms the "conceptualizing capacity" (*Women*, pp. 280-1). Were I to have the time, I would critique these three "abilities" in similar terms. For all these the issue is that mapping onto something requires a pre-existent target with some structures and qualities and then the question is how do they get such qualities since their origination seems necessarily to succeed the precognitive experiences and structures arising from them. The other issue is invariably the unidirectionality of the "projection" process involved in all these processes of conceptualization.

the same. There are obviously cultural, historical, and individual variations. These add a healthy messiness to category theory that is always considered unwanted in classical theory. It is proposed that understandings and distinctions of categories are based operationally on best cases or “prototypes” rather than on logically defined distinctive features. A prototype is a loose idea of what a representative of a category should generally look or be like and then other members of the category can be admitted or excluded based on some proposed likeness or difference to the prototype.⁴²⁶ Obviously this similarity/difference could be constructed in terms of limitless attributes of the prototype. The prototype arises based on the most common or natural gestural patterns, affordances (Gibson), enactions (Varela) one would have with a category delimiter and there are fairly clear grounds for how these prototypes are selected and function. Best examples usually function without awareness or consciousness to distinguish categorical boundaries. And, obviously, best examples (prototypes) are not the same from culture to culture; they are not necessarily universal. This helps us appreciate the complexities of communication and the rich varieties of worldviews. It might be argued that if classical category theory held, there would be no need for comparative culture studies.

As for the relevance of this discussion of category theory to the study of religion and culture, let’s be ambitious and begin with the term that labels the category that gives all of us a common disciplinary identity, religion. It is rather standard fare for students of religion, at one time or another, to think a bit about this term. In my graduate school days, it was common to attempt definitions of religion and obviously I’m still working on it. This invariably led to collections of definitions that have been offered among a wide range of religion scholars. It also led to trying to understand what we mean by definition and making distinctions between lexical definitions and phenomenological definitions. This discussion would arise because it used to be fairly widely held that religion is the ineffable and how on earth can you define the ineffable?⁴²⁷ Such discussions about definition and even definitional strategies always become tedious to the max and eventually just plain boring. Most such discussions simply provide a bit of lip service to the matter and go on. Still, this isn’t completely satisfying or even acceptably academic. Jonathan Smith has made a strong case that we invent religion, that is, that religion is the invention of those who study it. Only some scholars are even open to this idea.

The discussions of category provide some insight to the matter of defining religion. Eleanor Rosch and George Lakoff make much of the prototype theory of category.⁴²⁸ Rather than members of a category sharing one or more distinctive traits, these traits being definitional criteria, the prototype theory holds that categories are based on best examples joined by others that can be related to them in various ways and degrees. Implications of the prototype theory also hold that categories, like colors, are not distinctions in the world independent of us. Rather categories are the product of human interactions with the world

⁴²⁶ Significantly this usually unconscious comparative operation is not based on external fixed reason or given principles but, as argued in an earlier essay, on feelings of coherence.

⁴²⁷ In think there is a good bit of this remaining as reflected in the discussion of religion in Ann Taves’ recent book.

⁴²⁸ George Lakoff, *Women, Fire, and Dangerous Things* (Chicago: University of Chicago Press, 1987). Lakoff discusses Rosch’s work in detail.

and clearly, like color, they are the product of a tangle of perceptual and cognitive processes all ultimately grounded in body, in sight, in self-movement, in gesture, in brain, in touch. Biology, neurology, culture, history, and individual experience all play critical parts. Certainly then the term “religion” refers to a category constructed in the same fashion. It is simply untenable to hold that religion exists as religion apart from some historical process of conception, observation, categorization. Notably, when I was studying Australian Aboriginal cultures, Baldwin Spencer and Francis Gillen’s classic *Native Tribes in Central Australia* was a critical source for Eliade and Smith and other scholars in their endeavor to define religion, yet the term “religion” does not even occur in the index of this book; Spencer (and his British mentors) didn’t recognize as religious anything in these cultures.

Historically the academic study of religion emerged largely from Christian studies. All one need do to be overwhelmingly persuaded by the impact of this heritage is to read Walter Capps’s book, *Religious Studies: The Making of a Discipline*.⁴²⁹ In this thick book the first non-white, non-Christian, non-male scholar doesn’t show up until near the end. Complement Capps’s book with Robert Orsi’s discussion in *Between Heaven and Earth* of the history that led to the academic study of religion limiting its subject largely to Protestantism Christianity.⁴³⁰ The sensorimotor patternings or gestures that have created the schemas that we unconsciously draw on when we think of religion in any way are those that were experienced by thousands of dead white Christian bookish sedentary men. Quite the groove! And it doesn’t take a Lilly funded study to identify Christianity as the operative prototype we continue to use as foundational to the academic study of religion, though now rather unconsciously, as our best case for our deeply embodied understanding of religion. As students of religion, virtually every question we ask, every sub-category we engage, every phenomenon we identify is rooted in an understanding of Christianity held, not by the broad spectrum of practicing Christians throughout Christian history, but by that elite group of white male intellectuals that spent their entire lives sitting immobile thinking and writing about Christianity. Thus it is not even broadly practiced Christianity that serves as our prototype, but only intellectual Christianity.⁴³¹

I am not sure we can grasp the depth and pervasiveness of the impact on us of these deeply engrained gestural patterns. I suggest that they establish the reality of the academic study of religion, a level of subconscious and tacit agreement borne in the body as gesture and posture. To say that our understanding of religion as an academic category is based on the gestural patterns of intellectual Christianity seems almost inappropriate since we would generally think of intellectual Christianity as “disembodied.” Yet, an important point being made in this book is that even intellectual Christianity is determined in gestural/movement terms. The prototypical gestural clusters that shape the world as encountered in intellectual Christianity are sitting, writing, verbal discourse, limited whole-body motility with movement/gesture concentrated on the hand and the head (face), postural

⁴²⁹ Walter Capps, *Religious Studies: The Making of a Discipline* (Augsburg Fortress Press, 2000).

⁴³⁰ Orsi, Robert. *Between Heaven and Earth* ...

⁴³¹ It is interesting to me that the academic study of religion has tended to be self-satisfied at being both at odds with the experiences of the subjects they study and of being of practically no relevance at all to the world beyond the narrow fiend of their study.

preferences for the kyphotic. I am well aware that this is an outrageous sounding claim, yet I think we are aware of the shaping powers of gesture and posture about to the same degree we were aware of germs and their influence in the mid-nineteenth century at the time of John Snow's 1849 essay *On the Mode of Communication of Cholera*.

When we encounter religion as a category we must then relate to our functioning prototype—intellectual Christianity—but we do so more proprioceptively connected with our prototypical gestures/postures/movement schemas then we are intellectually aware because these actually function to ground, give gravity to, the labels we give to the distinctive characteristics of religion. Operatively then religion as a category is foremost determined by what is included in our gestural/postural patterns; religion is a study of writings—primary, secondary, tertiary—no matter. Religion is a study that produces writings and, to a lesser degree, talkings. After this then, we are freer to limit writing and talking based on other content items in the prototype, such as commonly the vague “belief in god,” the presence of a “figure comparable to Jesus Christ,” something that looks like the “Christian church.”

There is nothing wrong or inappropriate about this way of defining religion (it is simply what occurred historically), yet it is important to appreciate the implications of this definitional process in light of an experiential/movement/gestural basis of delimiting category/definition. The study of religion then is gesturally a way of confirming our reality in ways that we may not be fully aware of. And knowing this allows us to see that religion might well be understood quite differently, yet this would necessitate the construction/engagement of other experiential gestural patterns.

The academic study of religion has pretty much ignored such obviously religious phenomena as prayer acts,⁴³² ritual, dancing, drama, music, art. We can now perhaps begin to appreciate why such odd exclusions occur. They simply are not features that have been connected with prototypical/gestural patterns of intellectual Christianity that our forefathers constructed and passed along to us. It is quite difficult to imagine our intellectual fathers dancing.

In their 1991 book, *The Embodied Mind: Cognitive Science and Human Experience*, Francisco Varela, Evan Thompson, and Eleanor Rosch's extensive discussion of Buddhism as a traditional philosophical source to assist us in our understanding of enaction and its implications raise an interesting idea. While I don't see the point of the vague term “enaction,” let us suppose that the academic study of religion had been based on an understanding of religion where the prototype for a religion was Buddhism.⁴³³ It would be interesting to take some time to start with this idea and attempt to play it out guided by Buddhists or authorities on Buddhism. My guess is that, if we could pull it off, we wouldn't end up with much even recognizable from our current practice. Clearly how could an understanding with an operative prototype inseparable from self-movement ever led to

⁴³² An exception is the current prayer study led by Ana Gade ????

⁴³³ Varela ... offer an extended example of the consideration of the parallels in Buddhism with the ideas they are introducing as key to emerging cognitive science. [complete this w/ closer attention to their book]

even gestural/postural practices of contemporary western academics. Even the furniture of learning (should it exist) would be completely different.

I want to briefly consider what might be involved in this sort of alternative. First, because of the powerful influences of gesture and their effect of naturalizing the accompanying posture/position, it is difficult to imagine an alternative. So to offer an alternative is rather like leaving a force field that we are not even aware is powerfully holding us in place. Yet, I have tried over the years to imagine what this is like. Teaching dancing in the academic context of the study of religion has offered me a specific challenge. I began many years ago simply reading descriptions of dancing and statements of dancers and ethnographers about how these dances were located in the cultural/religious contexts. I could develop correspondences of the structures and patterns of the dances (where I could even find such things described) with religious ideas and concepts and theologies. I supplemented with films of dances and, with the advent of YouTube, this visual aspect became progressively easier. Yet, from the earliest days of teaching dancing in this way, I discovered that this wasn't enough or adequate.

The very first summer I taught dancing in the early 1990s while studying Greek dancing a student in the class indicated that she knew one of the dances we were studying and she offered to teach it to the class if we wanted. We pushed aside the chairs and learned some basics of this dance. I then realized that learning about dancing by reading about it is similar to studying music by reading music scores, or more accurately, by someone describing the music in the most general terms, without hearing the music.

Gaining this basic insight (reaching escape velocity) I immediately began adding studios as requirements to my "religion and dance" classes. We split our time in classic mind/body dualism between classroom, lecture and discussion, and studio where the dances we were studying were experienced in the moving bodies of the students. I think this experience offers some insight about how to change the prototype on which our understanding of religion rests.

Clearly for me, while it has unfolded over two decades, I believe that my intellectual thinking, my processes of learning and writing and developing hypotheses, has been deeply influenced by twenty years of dancing and engaging dancing through a moving feeling intellectual body. This does not mean an abandonment of intellection (and I hope there are but few signs of that in this book); but it does mean that the way one exists in a moving lifestyle is inseparable from the style of not only thinking, but also the very subjects one is aware of to think about.

With gesture foregrounded, religion is neither belief nor matter; it is the engagement of both (and so much more) inseparably in the moving processes of vitality. From this perspective it would not be possible to limit one's academic methods to the gestures of reading and writing and talking and thinking. And being freed of these limitations religion and the study of religion would demand movement and action and process and play and wonder and energizing vitality. Ritual and dance and drama and certainly writing/reading/talking would be enactments (verbs) not thingy objects (nouns).

It might be very easy to hear what I am suggesting as a movement toward some foo foo religion light (or lite); drum circles and universal dances (whirling). I assure you that these

(as activities to do rather than as subjects to study) are rather distasteful for me although I have encountered them regularly over the years. But I remind that what I am suggesting is not very dissimilar than the laboratory in the natural sciences. Some aspect of moving experience is essential to the natural sciences. We require students to take courses with laboratory sections. I think it more than ironic that it is the hard sciences that recognize and require movement encouraging movement-based learning and research, while the study of religion and the humanities seem to fear and dismiss this style of research and learning.

I remember a conversation I once had with Donald Lopez⁴³⁴ about how the things that initially motivate our interest in the study of religion are often later discovered to be not academically respectable or accepted and we have then to give them up as we become academics. Now I'm not suggesting that we promote bad academics, but I do think that the excitement that motivates our interest is almost always based in movement; we describe it as something that moves us. I am saying that if we cannot retain that energetics of movement as we be academics, we should follow Massumi's advice and just hang it up.

It seems that the implications of these insights are strong support for Smith's idea that we invent religion, but it also is strong support for the absence of our awareness that we do so. We simply don't know that we see red, blue, and yellow because of a complex entangled set of subconscious or wholly unconscious neurophysiological processes. Surely the case is the same with religion. That such effects occur at a subconscious and gestural/postural level to actually determine what we see and how we value what we see means that we are usually not aware of it; remarkably even as academics. Yet, should we choose, we can know that these processes are at work and even specifically how they impact us.

Yet I believe, always faithful to plasticity, that knowing something of the background of conditioning and determining processes, we may purposefully go about our work anew. Coming to know that the operative prototype for our study of religion is intellectual male-dominant body-restrictive Christianity, we can do personal archaeology to learn how this prototype shapes our world and our work. Discovering the deeply determining nature of sensorimotor patternings (gesture/posture) and their interconnection with cognition, we may finally recognize the potentially determining impact of intellectual gestures/postures, the icons of our educational system, and chose to exercise and explore other gestural patterns, alternative postures. We can begin to exercise (physically as well as metaphorically) our body/minds to create new gestural patterns that may embody new schemas that will change who we are and the world we experience and study.

⁴³⁴ And certainly Lopez has long actively engaged in the very discourse I'm developing, including his latest Lopez, Donald S., Jr. *Buddhism and Science: A Guide for the Perplexed*. Chicago, IL: University of Chicago Press. 2008.

Thinking

In their 2002 book *The Way We Think: Conceptual Blending and the Mind's Hidden Complexities*, Gilles Fauconnier and Mark Turner⁴³⁵ are almost worshipful of the largely invisible and unknown processes they attempt to glimpse for us; we all should be so impressed. They argue, “double-scope conceptual integration [what they commonly term “conceptual blending”] is crucial to the activities that make us what we are.”⁴³⁶ Conceptual blending is the way we think, from quotidian to high-level cognition, engaged by all people of all mental capacities throughout life. Conceptual blending is done at high speed and we have evolved in such a way that we are not conscious of the process and further that we even find it difficult to tease into some awareness. Conceptual blending is a “double-scope conceptual integration,” that is, the mental integration at amazing speed of two extraordinarily different inputs to create new emergent structures. Fauconnier and Turner state their major claims.

Nearly all important thinking takes place outside of consciousness and is not available on introspection; the mental feats we think of as the most impressive are trivial compared to everyday capacities; the imagination is always at work in ways that consciousness does not apprehend; consciousness can glimpse only a few vestiges of what the mind is doing; the scientist, the engineer, the mathematician, and the economist, impressive as their knowledge and techniques may be, are also unaware of how they are thinking and, even though they are experts, will not find out just by asking themselves. Evolution seems to have built us to be constrained from looking directly into the nature of our cognition, which puts cognitive science in a difficult position of trying to use mental abilities to reveal what those very abilities are built to hide.⁴³⁷

When the authors consider blending as compared with identity and analogy theory they write, “Identity and analogy theory typically focus on compatibilities between mental spaces simultaneously connected, but blending is not to obscure incompatibilities but, in a fashion, to have at once something and its opposite.”⁴³⁸ We can see that what Fauconnier and Turner understand as blending is similar in important ways to the copresent implication I have been developing in a variety of ways throughout this book. It is compatible with Gerald Edelman’s account centered on reentrance. Metastability and nonlinearity, important to coordination dynamics, are compatible terms. The way we think, they argue, is characterized by a structurality that blends impossibilities and improbabilities to create new relationalities, new meanings, new knowledge, new patterns. The hidden yet pervasive incompatibilities fuel thought.

While we cannot perceive, have an awareness of, the detail of our own blending mental processes, I’d suggest that this doesn’t mean that we are completely unaware that the process is occurring. Our awareness occurs in terms of a feeling kind of knowing, often a

⁴³⁵ Gilles Fauconnier and Mark Turner, *The Way We Think: Conceptual Blending and the Mind's Hidden Complexities* (Basic Books, 2002).

⁴³⁶ Fauconnier and Turner, p. 389.

⁴³⁷ Ibid., pp. 33-4.

⁴³⁸ Ibid., p. 29.

vague sense that implicates vast processes whose details are beyond our access. Not only can we feel ourselves in the “blend” mode, we also seem to have a perspective on this ongoing process. We seem to monitor our feelings associated with the ongoing blending awaiting that moment of release related to potential coherence. Peirce, as I have discussed, understood this and presented it in syllogistic form. We all know it as accompanying that brief hesitation when we prepare ourselves to respond to a question, to begin writing a sentence, to initiate a stream of conscious thought. The words “well” and “so” and the non-word “uhhh” that commonly begin sentences, especially answers, mark the pause that is necessary for a monitoring of this feeling attribute attached to blending.

Although I think it simply fortuitous, we students of religion may find special delight in an example Fauconnier and Turner used to illustrate blending, the Buddhist Monk Riddle. Let me repeat it here.

A Buddhist Monk begins at dawn one day walking up a mountain, reaches the top at sunset, meditates at the top for several days until one dawn when he begins to walk back to the foot of the mountain, which he reaches at sunset. Make no assumptions about his starting or stopping or about his pace during the trip. Riddle: Is there a place on the path that the monk occupies at the same hour of the day on the two separate journeys?⁴³⁹

Fauconnier and Turner use this as an example to illustrate in some detail the blending processes that are engaged by the riddle. Using diagrams they chart the initial “input mental spaces,” the journey up the mountain and the return journey. Using other diagrams, they show “cross-space mapping,” that is, the correlations between the input mental spaces. Yet, to resolve the riddle they hold that we create a “generic space” in which the separate input mental spaces might be related. This is basically that the upward and downward journeys may be played simultaneously even though this is physically impossible. In other words, they argue that it is matter of course for our mental processes to create metastability; it is this condition of the impossible that is fundamental to the creative thought processes. Once this simultaneity or metastability is established then another space is created in which the factors of the question of the monk’s riddle can be placed to provide an answer. Basically one creates a space in which the monk goes both up and down the mountain on the same day rather than separated by several days. Although there is the “not” that it is impossible for the monk to go both directions simultaneously, it is yet part of the way we use blending to think. When it is realized that the monk going up must meet himself coming down, it suddenly becomes clear that there is indeed a place on the path that the monk occupies at the same hour of the day and that such a place must exist without regard to pace or pauses. Riddle solved . . . well at least in Fauconnier and Turner’s reckoning.

While I don’t contest Fauconnier and Turner’s use of this little problem to illustrate the blending process and its apparent results, I want to show that Fauconnier and Turner’s approach to the riddle might have been more creative and interesting. They only scratch the surface of blending . . . hmmm, there must be a better metaphor . . . rather, they only blended tomatoes and onion when they could have made salsa.

⁴³⁹ Ibid., p. 39. This riddle is from Arthur Koestler’s book *The Act of Creation*.

First, let's look at the other example of the same situation as presented in the Spanish short story "*Páginas inglesas*."⁴⁴⁰ Here a man must prove that he was "twice on the same spot at the same hour. He has just run down the hill in twenty minutes. The day before, he had climbed the hill in five hours. But the twenty minutes are contained in the period of the day spanned by the five hours."⁴⁴¹ Now there are important differences between the Monk's Riddle and this Spanish character's need for proof. To begin, Fauconnier and Turner refer to the monk's situation as a riddle, but they do not identify the event in the Spanish story using this term.⁴⁴² A riddle is a statement or question having a double or veiled meaning, put forth as a puzzle to be solved. Riddles purposefully misdirect and that is why they fascinate us. They make us think that we have the answer when our direct pursuit of the obvious misdirects us from the information crucial to the riddle being a riddle. A problem has no purposeful misdirection. Fauconnier and Turner consider what they persist in referring to as the Monk's Riddle, without ever acknowledging the distinctive structure of the riddle. In streamlining the riddle as a problem they also ignore that the traveler is a Buddhist monk, that the monk spent days on the mountain top meditating, and that the journey was to a mountaintop. They gave more attention to the copresence of car and hiker in the Spanish story, which cannot be literal without the demise of the hiker, than they gave to these details in the other example. They miss the seduction of the riddle by their eagerness to produce a resolution to the problem that, I believe, serves to hide the more likely center of the riddle. They are premature blenders.

Here is where we, as students of religion, may be better able (for once!) to understand the Monk's Riddle as indeed a riddle. What are some of the blendings we might engage? Well, I am not a student of Buddhism, but I can give a start. As a student of Mircea Eliade, I can say that mountaintops are understood as *axes mundi*, world axes. A mountaintop is often the point where the creator and created separated as the world came into existence.⁴⁴³ The mountaintop is where humans go to meet god. Mountaintops are where heaven and earth meet. Mountaintops are where enlightenment occurs, where god speaks to Moses, to Mohammed. Pilgrimages are destined to mountaintops, and so on. Buddhism is often described in elemental terms as an eight-fold path, that is, as a journey, and meditation is designated as the following of one of those paths. These paths are often depicted as spokes in a wheel and certainly the hub is homologous with the mountaintop, with the world center as an enlightenment place. After enlightenment one is a *bodhisattva*, an enlightened one, yet still living a structurality where the "becoming" of physical existence is copresent with the "being" of the enlightened condition. Well, you can continue this exploration that

⁴⁴⁰ This story is by Spanish writer Pedro Zaraluki.

⁴⁴¹ Fauconnier and Turner, p. 52

⁴⁴² I have yet to learn enough about this story to say much, but I did find that the story "invites us to solve a riddle in '*Páginas inglesas*,' which cleverly synthesizes metaphysics, arithmetic, and fine irony." Thus it seems that Fauconnier and Turner may not have actually considered this story in as much depth as they might have.

⁴⁴³ Interestingly this setting apart of the creation from the creator is in some ways homologous with the structurality of perception and metaphor, yet the reverse. In creation the direction is from the invisible to the visible, while in perception and metaphor is runs the other way.

is certainly replete with blendings. Taking this path, the solution to the riddle would then be something like the monk occupies every place on the path at the same hour because, for an enlightened one, all paths, as all times, are copresent.⁴⁴⁴ The riddle then returns to the problem of the copresence, yet now with a blend that required an excursion into Buddhism. This solution to the riddle pleases in far different terms than does the solution to the problem. And the resulting feelings of newfound coherence arise in the awareness of the blending and copresence of the wisdom of Buddhism being somehow reflected in a novel understanding of this much simpler matter of temporal copresence on a quotidian path. Where Fauconnier and Turner observe the “aha!” moment in resolving the problem of temporal copresence, surely this is nothing compared to the “quiet smile” that bemuses the face of the one who blends this copresence, and affirms it and lets it stand, with that of an entirely different order.

I can’t resist carrying this just one step further. Enlightenment then, in this example, corresponds to the experience of pure depth, thickness, flesh on which existence succeeds and depends. Enlightenment is a living in the chiasm, that gap where the “is” and “is not,” where “being” and “becoming,” co-exist in eternal play or *lila*. Okay, I’ll stop with that.

Perhaps Fauconnier and Turner were well aware of this richness and felt it better to ignore it so they could make their blending example in the simplest terms. However, I believe that it is clear that the example as I considered it is far richer and more interesting. It also enriches their basic insights regarding the way we think. It also for me supports the shift in the way I believe we should understand religion. I am suggesting that rather than religion being seen primarily in terms of providing the resolution to complex and confounding problems to achieve peace and joy, it has greater potential for vitality and interest if seen as posing the impossibles and confoundments that are at the heart of the processes of thinking, that fuel thinking—and not only thinking, but also all human vital action—that are at the heart of the neurobiological processes of coordination dynamics. The distinction of religions is to create copresence, metastabilities, on the grandest scale, not that they offer the promise of solution, but rather because they are the engines of vitality, because they fuel ontogenesis.

Finally, I want to turn once again to the topic of creativity. The question is something like “How do we think a new thought?” or “How do we come up with anything new?” In Peircian terms, as I have discussed in some detail, this is a matter of hypothetic inference or abduction. In Fauconnier and Turner’s terms it is a matter of certain novel blendings.⁴⁴⁵ Inspired by Jean Baudrillard’s *Seduction* (1991), where he importantly distinguishes seduction and production, by creativity I do not intend anything like production or productivity. One of the things I am most concerned about as a teacher is the paucity among students of the sort of creativity to which I point. Peirce, I think, understood it well. Creativity, as hypothetic inference, is motivated by the experience of surprise, an emotional state that seeks stability and dissipation of unrest (coherence). A hypothesis is created to alleviate the conditions that give rise to surprise. Jonathan Smith, often cites Paul Ricoeur

⁴⁴⁴ I haven’t yet looked up Arthur Koestler’s use of this riddle in his book *The Act of Creation*, yet I will do so.

⁴⁴⁵ Even this notion raises the issue of what is novel about these blendings.

who noted that “incongruity gives rise to thought.” Mid-life, illness, and other life passages and crises are common occasions for experiencing incongruity on the scale to motivate increased action and awareness. Crisis of almost any kind is a common stimulant for creativity. Unfortunately it appears that we must be bludgeoned and whackered into our creative moments.

There is perhaps an alternative and that is to understand the structurality of creativity and to cultivate an appreciation for, or tolerance of, incongruity or the hidden or seduction or provocation or pure depth or gaps or play. Creativity demands a manipulation of blending or double-scope conceptual integration. What drives creativity? Since creativity often seems a nuisance and has the potential to get one into trouble, why seek it? Creativity may be thought of as consciously and purposely engaging in blending, in double-scope integration. Creativity may be thought of as attempting to become aware of these blendings despite our seemingly being blocked from “looking directly into the nature of our cognition.” We nonetheless may open ourselves to the occasional flashes that are emitted from these blendings, flashes in which we may see or feel anew. Creativity is to participate, even if from the sidelines, in this amazing, indeed awesome, process that, as Fauconier and Turner appreciate it, is “crucial to the activities that make us what we are.” To be creative then is to exercise that which distinguishes us as human beings. Creativity is to nurture quintessential human style.

Perceiving and Religion

[all of this is from the other ms]

Another passage from Merleau-Ponty and a good one offers a powerful summation of the mandate that drives his philosophy.

We have to reject the age-old assumptions that put the body in the world and the seer in the body, or, conversely, the world and the body in the seer as in a box. Where are we to put the limit between the body and the world, since the world is flesh? Where in the body are we to put the seer, since evidently there is in the body only “shadows stuffed with organs,” that is, more of the visible? The world seen is not “in” my body, and my body is not “in” the visible world ultimately: as flesh applied to flesh, the world neither surrounds it nor is surrounded by it . . . there is a reciprocal insertion and intertwining of one in the other.⁴⁴⁶

Fundamental to perception is the intertwining of what are necessarily independent. What Merleau-Ponty showed us is that this intermingling is not some minor feature, some odd aspect, but is rather at the heart of comprehending animate life. This is his great legacy.⁴⁴⁷ As flesh literally indicates the interdependence and intimacy of inside and outside—in former discussions, between exteroceptors and interoceptors; subjectivity and objectivity; touch and feeling or emotion; and so on—Merleau-Ponty projects, by analogy, the same relationship between the body and the world as one of flesh and thus there must be “the

⁴⁴⁶ Ibid., p. 138.

⁴⁴⁷ Inspiring to so many, but especially Renaud Barbara.

flesh of the world." Flesh is then, as Merleau-Ponty goes on to say, "an 'element' of Being,"⁴⁴⁸ "an ultimate notion,"⁴⁴⁹ "the ultimate truth."⁴⁵⁰

Flesh is further fleshed out by Merleau-Ponty in terms of "hinge," "fold," "reversibility," "turned inside out," as well as "dehiscence," "intertwining," and "chiasm." While vision dominates as the exemplar, touch actually underlies all his vision examples. Reading Merleau-Ponty it seems that touch insinuates itself more and more as he moves progressively from the surpassed *camera obscura* model of the senses through his exploration and development of the idea of flesh. Touch progressively replaces vision as exemplary.

I am intrigued by Luce Irigaray's discussion and extension of Merleau-Ponty.⁴⁵¹ Merleau-Ponty spent a great deal of time meditating and pondering on one hand touching the other and, as I picture it, the whole hand is too meaty, too fleshy for this image. I think Merleau-Ponty has in mind something more like the fingers, the penetrating fingers. Irigaray offers another analogy.

The hands joined, palms together, fingers outstretched, constitute a very particular touching. A gesture often reserved for women (at least in the West) and which evokes, doubles, the touching of the lips silently applied upon one another. A touching more intimate than that of one hand taking hold of another. A phenomenology of the passage between interior and exterior. A phenomenon that remains in the interior, does not appear in the light of day, speaks of itself only in gestures, remains always on the edge of speech, gathering the edges without sealing them.⁴⁵²

Although I don't understand why she didn't depict the fingers of her example as intertwining rather than outstretched, Irigaray's alternative imagery helps us see how male-object-production oriented is Merleau-Ponty's crown example. As Cathryn Vasseleu writes in *Textures of Light* (1998), Merleau-Ponty is shown by Irigaray to have had a "preoccupation with an agent for whom perception is a holding on to things as objectives and thus a means of maintaining oneself in the world."⁴⁵³ Irigaray's "contiguous touching refers to a mode of sensibility which, in maintaining itself as sensible, parts company with things."⁴⁵⁴ This shift is referred to by Vasseleu as a "tangible invisible" which she describes as "the body as a positive reserve, a vitally constituted dimension, an adherence to indetermination rather than the surfacing of an unrepresentable interior."⁴⁵⁵ Tactility then is the primordial sense in which the body's interiority is constituted. Recalling Brian Massumi, I think that the proprioceptive dimension of tactility would be yet a more

⁴⁴⁸ Ibid., p. 139.

⁴⁴⁹ Ibid., p. 140.

⁴⁵⁰ Ibid., p. 155.

⁴⁵¹ See Cathryn Vasseleu, *Textures of Light: Vision and Touch in Irigaray, Levinas and Merleau-Ponty* (New York: Routledge, 1998).

⁴⁵² Quoted in Vasseleu, p. 66.

⁴⁵³ Ibid., p. 66.

⁴⁵⁴ Ibid.

⁴⁵⁵ Ibid., p. 67.

accurate, if less emotionally charged, reference. Irigaray's lips present an alternative, a predecessor actually, to Merleau-Ponty's hands. Vasseleu puts it this way.

Before the intentionality of the "double touch" (which divides touch between sentient being and the touched object), the indeterminacy of the "hands that touch without taking hold—like the lips" (Irigaray, 1993a: 170) constitutes the body as threshold or passage, neither an interior nor an exterior world.⁴⁵⁶

And, fittingly, Irigaray calls this intimate and unperceivable join of flesh, *mucous*, or as she puts it "that most intimate interior of my flesh, neither the touch of the outside of the skin on my fingers nor the perception of the inside of these same fingers, but another threshold of the passage . . . between."⁴⁵⁷ Mucous is a touching without seeing, a tangible invisible. Irigaray's tangible invisible is a non-reflexive indetermination of flesh in/between flesh, a body reserve which is not subject or object and not active or passive. Vasseleu says, it "is an attentiveness devoid of anticipation or resistance."⁴⁵⁸

Proprioception is the body knowing itself in space and movement and I believe that, for me, it serves better the idea of tangible invisible than does mucous. After all, the most basic quality of mucous is lubrication invoking the anticipation or presence of movement, passage, penetration. Lips, mucous, inevitably anticipate an opening, an entering, a merging, a frictional relationship, a tight squeeze, a susceptibility to deterioration due to exposure, an otherness, a joining. Mucous occurs at body openings suggesting a relationship with objects that is not as gentle and persistent as the intermingling of sea and strand, that blends the object and subject. As one hand touching is extended into the world by Merleau-Ponty with the example of the handshake, touching lips might well be extended into the world, for example with the kiss, the deep kiss, and sexual intercourse to suggest the extension for Irigaray. These too are invisible tangibles, but involving our internal invisible tangibles with those created and enacted through certain intimate relationships with the world. While Irigaray attempts to reverse Merleau-Ponty's reversibilities, there remains something of this structurality when extending Irigaray's example beyond the body into the world, an extension that seems inevitable. Still, there are important differences. It seems that Irigaray's lips example bears a distinctly feminine relational character as opposed to Merleau-Ponty's object based example that is decidedly masculine.

Repetition, with variation, is fundamental to establishing for us the skill that, in academia, we often call concept. Merleau-Ponty used a great many terms elaborating his fundamental and profound understanding of perception. One of these that I find particularly clarifying is his concept "pure depth." As an extension of this consideration I'll turn to my studies of dancing as a candidate for being a powerful exemplar of "pure depth." And, turning that around, I will consider the implications of dancing for developing Merleau-Ponty when considered as "pure depth."⁴⁵⁹

⁴⁵⁶ Ibid.

⁴⁵⁷ Ibid.

⁴⁵⁸ Ibid., p. 72.

⁴⁵⁹ A fuller discussion of dance theory including how dancing is an important example of pure depth is available in *DCR* ????

To avoid the implications of a split dual structure of reality that he found to be unacceptable, Merleau-Ponty introduced unity and continuity among parts whose distinction remains preserved. Inseparability and absence of distinction among its constituents would simply collapse reality. Somehow there must be distinctive constituents of reality yet they must not be wholly separable from one another. Merleau-Ponty's consideration of this thorny matter focuses on the arena of human perception, our primary means of knowing and engaging the world beyond our own body limits. Perception is the fabric of our connection, the hedge against isolation. He creates a unified ontology by showing that perception overcomes the common subject-object dualism. However, to avoid the collapse of all distinction he had also to somehow accommodate *distance*, inherently a negative as Barbaras shows, and this led to his understanding of perception which amounts to an ontology, his flesh ontology. Without distance there is no need (*desire*) for perception.

Distance is key, yet distance must be understood relationally and this suggests "depth." The concern with how we perceive depth is an old one, traditionally understood as "a line endwise to the eye."⁴⁶⁰ Depth was thought as derivatively perceived, added to an otherwise flat and static image produced by a two-dimensional array of radiant energy on the retinal surface. Maurice Merleau-Ponty and James Gibson (among others) rejected this classical explanation. Notably, Merleau-Ponty's ways of resolving the issue of distance and depth correspond with the foundation of his flesh ontology. Depth comes to be understood as that which both allows difference and distinctness while creating a bond or connection or identity between perceiver and perceived. Depth is "strand" in the Merleau-Ponty passage I considered above. The exploration of depth is complex and profound and exciting.

James Gibson's approach⁴⁶¹ is environmental. For Gibson distance is an intrinsically dynamic concept that entails movement. We don't actually see depth but rather we see one thing moving behind another. Movement reveals the occluding edges of objects that are separated yet connected along the dimension of depth. Gibson formulates depth in terms of paradox, a "unity through disparity." The environmental aspect of his approach is articulated in *affordance*, as he termed it. Affordance is understood as the value of things in the environment and value is always understood in terms of the relationship to the perceiver. In terms of my view of gesture as a looping action (to be presented more fully below), affordance corresponds with the afferent side of the gestural loop. Thus depth is the dimension that points both to the object and to the perceiving subject. Depth is the significance of surfaces in relation to the body.⁴⁶²

Merleau-Ponty held that an essential aspect of every perception is a spatial orientation. It is always already there because it must be presupposed in the body holding some place in the world as the locale for perception. This is then a primordial spatial orientation. Perhaps we might enhance our understanding of Merleau-Ponty's idea here in terms of

⁴⁶⁰ From Berkeley's *New Theory of Vision* cited in Sue L. Cataldi, *Emotion, Depth, and Flesh: A Study of Sensitive Space* (State University of New York Press, 1993), p. 30.

⁴⁶¹ James Gibson, *The Ecological Approach to Visual Perception* (Hillsdale, N.J.: Lawrence Erlbaum Associates, 1986).

⁴⁶² See Cataldi, pp. 31-34.

proprioception, the ability already active at birth (and surely before)⁴⁶³ of the body to locate itself and its parts in space through movement. From birth the body simply exists and orients itself by moving in space already existing. Merleau-Ponty holds that we come into the world as perceptible bodily beings, or we belong to the flesh of the world. The body is already oriented by being a body. The motor programs we are born with in a sense presume depth in their “reaching out” to touch or grope an environment.

The body however has in its structure and behavior examples of distance and separation that are also unities. The example with which I opened this chapter, one hand touching the other hand (finger on one hand touching the other hand), is a favored one for Merleau-Ponty. Another is the stereopsis in vision based on seeing with two eyes. We, in fact, see the world clearly, under normal circumstances, through two separate eyes that “see” separate images. We can test this easily by closing first one eye then the other in a variety of situations. Difference, separation, is easily confirmed. Yet, so also is the unity of vision. Even vision situations in which there is a distinct disparity between the images separately seen by our two eyes get reconciled and they “snap” into place as a unified image that is nearly impossible to then willfully separate. This separation yet unity is fundamental to Merleau-Ponty’s consideration of depth. And, of course, the trigonometry in stereopsis is a factor in depth perception.

Depth at this naïve level then is understood as that dimension by which we see something from “here” that is at its place “there.” The “here” and “there” are contemporary in our experience. Here and there are joined in time through their visibility and this is “depth,” a space of “copresent implication.” When movement is factored in, as necessary to such perception, then, very much in the same terms as Gibson’s affordances, Merleau-Ponty appreciates depth as a “sensitive space,” as “living movement,” as “lived distance.”⁴⁶⁴ Depth is a way of comprehending that perception is a genre of movement. As Barbaras put it, “Perception puts the living being in touch with what is spatially at a distance.”⁴⁶⁵ Depth, in this progressive consideration, becomes increasingly profound. It is that dimension that contemporaneously unites and separates. It is “a thick view of time.”⁴⁶⁶ Depth is the “most existential dimension.”⁴⁶⁷

Depth, we might here call it more properly “pure depth,” then is a dimension that is primordial, allowing the perception of distance and the value of the distant. Primordial depth, in itself, does not yet operate between objects, between perceiver and percipient. “Pure depth” is depth without distance from here.⁴⁶⁸ In its thickness, preceding perception depth is perhaps difficult to grasp. Merleau-Ponty offers an analogy that both depends on

⁴⁶³ See Shaun Gallagher’s presentation of neonate imitation, pp. 69-73.

⁴⁶⁴ Erwin Straus clarifies, “Distance is a primal phenomenon ... there is no distance without a sensing and mobile subject; there is no sentience without distance.” Quoted from his *The Primary World of Senses* in Cataldi, p. 45.

⁴⁶⁵ Barbaras, “Life, Movement, and Desire.” 9

⁴⁶⁶ This notion of a thick view of time will correlate with my notion of a “fat present” that I develop extensively in *Vitality* (forthcoming).

⁴⁶⁷ Cataldi, p. 45.

⁴⁶⁸ Ibid., p. 48.

vision and also foils vision to the point of its replacement by touch, by feeling. This analogy is “dark space,” the experience of night or darkness. In darkness seeing is thwarted, yet seeing into the darkness elicits a feeling of thickness, a density, a materiality, a tangibility, an expectancy, an intimacy. In dark space everything is obscure and mysterious. Eugene Minkowski, an early twentieth century psychiatrist who offered the idea of “dark space,” held that “the essence of dark space is mystery.”⁴⁶⁹ The experience of dark space provides a means of trying to grasp pure depth. Pure depth is depth without foreground or background, without surfaces and without any distances separating it from me. Minkowski understood dark space, which Merleau-Ponty identifies with “pure depth,” as “the depth of our being,” as “the true source of our life.”⁴⁷⁰

Notably Drew Leder in his book *The Absent Body* (1990) critiques Merleau-Ponty for considering the body and perception only in the shallows of the physical body. We have noted that Merleau-Ponty occasionally includes interoception as in the inner feeling of outer touch, yet he does not present this in the specific terms of proprioception. Also, as Leder notes, Merleau-Ponty does not include the viscera. Based on Leder’s discussion, we might suggest that our own visceral awareness is an apt example of depth. The viscera are literally deep within our bodies and it seems we have a rather clear sense of viscera as at depth, yet always also “here,” as in functioning operations necessary for life. The relative absence of the viscera compared with the quotidian five senses also renders their presence in terms of mystery. And the radical messiness of the viscera, when physically seen, values this depth in terms of otherness, even offensive and terrifying otherness within.

Pure depth is key to understanding flesh which, like pure depth, as pure depth, is always already there as “the formative medium of the subject and object,” (precessive) as the “inauguration of the where and when” (progenitive).⁴⁷¹ The moving body is fundamental to flesh, because through movement flesh begins to understand itself or become aware of itself.⁴⁷² Flesh, without moving body, is only possibility, never actuality, percipience never perception. The moving body is then, as Merleau-Ponty termed it, a “percipient-perceptible,” that is, an entity possessing the power to perceive while also being capable of being perceived. The body is an intertwining of two sides, the adherence of a self-sentient side to a sensible side. The body as an intertwining blurs the boundary between the flesh of the world (depth) and our own bodily flesh. The body exists then in an ambience, a primordial given, of depth, the hidden dimension behind and in everything.⁴⁷³ The necessity of the environment corresponds with my discussion of the nature of living or self-movement.

This doubling is for Merleau-Ponty a reversibility. Reversibility is a way to express the interconnection among distinctions. A subject requires an object and vice versa; they are reversible; they move back and forth or loop among themselves. Movement is essential for reversibility to be realized, for occlusion to be recognizable, for perception to take place.

⁴⁶⁹ Eugene Minkowski, *Lived Time*, (1933), p. 429, cited in Cataldi, p. 49.

⁴⁷⁰ Cataldi quoting Minkowski, p. 50.

⁴⁷¹ Merleau-Ponty, *The Visible and the Invisible*, p. 140, quoted in Cataldi, p. 60.

⁴⁷² Cataldi, p. 61.

⁴⁷³ *Ibid.*, p. 67.

Yet, this reversibility is never complete. This is a fascinating phase in this argument, I think. Complete reversibility would result in identity among the distinctions and a collapse of perception; there would be no distinction of self and other and thus no perceiver, no force and vector to perception. Complete reversibility would leave us lost in the world of perceptibles. Were the touching of one hand with another to be completely reversible it would not be possible to distinguish one hand from the other. Merleau-Ponty's term "chiasm" here identifies this gap or crossover space. There must remain this undetectable, in itself, space or gap or hiddenness (the dimensionlessness of pure depth) for reversibility to be incomplete. Incomplete reversibility is not some flaw in perception to be overcome, it is rather the very motor that drives the movement of reversibility that allows for simultaneous interdependence and distance. It is Barbaras's "desire." It is Kelso's "metastability." Since the chiasm is hidden, since chiasm precedes and makes possible reversibility, it can be thought of as "depth," or better as "pure depth," as presented through the analogy of "dark space." Chiasm, pure depth, this incompleteness is the source or condition of perception and at the same time unifies flesh ontology.

I am well aware that these ideas may be difficult to grasp (the halt of the grasp is precisely our problem) and tend to be mercurial even as we lightly touch them, yet these ideas, and I believe even our resounding iterating repetitious way of trying to appreciate them, are fundamental to our understanding of ourselves as sentient beings and to the way we study other sentient beings in the context of religion and culture. Given our ongoing discussion of the importance of difference in the academic study of religion as championed by Jonathan Smith, I think it would be a rather more elegant argument to show that it isn't really sufficient to say simply that incongruity/difference gives rise to thought, but rather that difference is the gap or chiasm that both distinguishes us and unites us with our subject and without this gap, this difference, there simply would be no study of religion; the study of and the subject of study would be indistinguishable.

Both the romantic image we tacitly hold of religion that "religion is good" and the unquestioned belief that the modern agenda of the academy is to explain and articulate meaning place us on gestural and postural footing that beseeches us to close gaps, to find unity, to eliminate nonlinearity and metastability, to halt and grid. Our theories of religion, our definitions of religion, are constructed to halt movement (even if the subject is movement and relationship), to eliminate gaps, because our received and unquestioned understanding of theory, definition, and religion all demand that we do so. We can hardly help ourselves.

What I am presenting in an iterative and reiterative looping process in this book is to show that many of the assumptions we make about religion and its academic study are based on views that seem so routine as to be natural (indeed, so broadly accepted as to be outside our awareness), yet are not supported by philosophical and neurobiological findings that have emerged over the last century (and especially in the last quarter century). With each repetition it is my intention to reform the skills that reside like bad habits that we might find ourselves inspired to something other than a tighter definition or a clearer theory of religion, but to strategies by which we can appreciate that religion (and also efforts at defining and theorizing) depends on copresence, pure depth, chiasm—all adumbrated in living movement and play.

These ideas can also raise fascinating and provocative possibilities for understanding other aspects of our humanity. I want to turn now to dancing, considering it in these terms to both understand an exemplar of reversibility and transcendence, that is, how dancing may help us understand flesh ontology and also how flesh ontology may help us understand dancing in new terms.

I want to begin with the simple observation that dancing may be seen as a distinctive kind of making. It is distinguished by the relationship between the maker and the thing made. The dancer, in dancing, makes the dance. The dance is inseparable, physically inseparable, from the body of the dancer, from the body of the maker of the dance. Even in the situations where choreographers make up a dance that is set on the bodies of others, there is no manifest dance or work other than when danced. The existence of any dance is in it being danced and a dance cannot be danced apart from a dancing body. The distinction between the dancer and the dance is not difficult to discern, it is not ambiguous, and it is an aspect of the very designation of dancing. So the dance is other than the dancer, while also being identical with the dancer.

In light of my comments on Merleau-Ponty's understanding of perception and the body in terms of his flesh ontology, this description of dancing surely sounds familiar. It has similarities with the examples of two hands touching or of two eyes seeing, yet the dancing body presents a fascinating new wrinkle or kind of fold; there is no physical separation between the two parts, dance and dancer, these are identical bodies. It is in the movement act called "dancing" that the body is separated into dance and dancer, self and other in some respects, creating a virtual distance that allows reversibility, while at once holding self and other, dance and dancer, as unified, indeed as bodies identical.

Yet, how is this possible? Merleau-Ponty's notion of "pure depth" is valuable. There is an important distinction between the quotidian moving body and the dancing body. Following Merleau-Ponty we would expect that "pure depth" exists in the perceptual space in which the body locates itself. However, in the dancing body "pure depth" must be otherwise located. The reversibility in dancing, unlike that of perception, does not take place between the perceiver and percipient, joined in the flesh of the world. Rather reversibility in dancing takes place in the body of the dancer, in the action of dancing (making a dance), since in dancing self and other have identical bodies, the dancing body. The question then is where is the primal depth that precedes and makes possible the reversibility that occurs in dancing? We must look for an alternative to "dark space," that vision initiated experience of trying to see in the dark only to be foiled and thus forced into that thickness that is felt rather than seen. We can look immediately into that perceptive depth within the body that we have come to understand we are born with, perhaps even conceived with since it surely is functioning neonatally, and that is interoception or proprioception. These are the receptors by which we understand ourselves as bodies moving in context. These are the receptors that provide a sense of self, the feeling of "me," grounded in "my" self-movement. Proprioception can be described in terms identical with those that describe "dark space," that is, as primordial depth that constitutes a medium of thickness with a tangible diffuse materiality that is not held at a distance. While

proprioception⁴⁷⁴ provides the birth of “pure depth” in the sense that self necessitates a distinction, a distance from, other; proprioception alone is vague about the other, requiring the other to be nothing more than ambient space in which the body moves (Maine de Biran), in which the body is located. Dancing, however, is a making of an other and a concrete other, which is not yet set physically apart from the proprioceptively aware body. The dancing body is at once self and other, both known proprioceptively, rather than exteroceptively, experienced. As the essence of “dark space” is mystery, so surely must we so identify the essence of dancing. Dancing is the primordial depth that allows one to experience other and otherness proprioceptively and emotionally as one’s own body. Dancing creates depth without surfaces and without any distance separating other from me. Dancing is depth without foreground or background. The distance between self and other as experienced in the dancing body is pure depth (the distance is virtual), primordial depth, and yet manifest, made visible to others. Compared with “dark space” that foils vision and recoils to touch and feeling, dancing begins with that most intimate of feeling, with the thickness of feeling itself, in interoception and yet “shows” it in the observable act of dancing. Dancing is distinguished in the realm of movement in its identity with depth, with the mysterious thickness that allows the distance of self and other while holding them together in one body. Dancing is movement that is “pure depth” and thus precedes the movement upon which perception, or better exteroception, depends.⁴⁷⁵

A quick note on the distinction between the danced other and the viscera as other may be useful here. First, the danced other is proprioceived as other, amounting to an awareness, a felt experience of other both to dancer and to one observing the dancing. Viscera is inferred as other only occasionally felt and then only vaguely so. The limited experience of the otherness of one’s viscera is not available to an observer. Further, the incompleteness of the reversibility of dancer/dance distinguishes dancing as fundamental to the chiasm, the gap that enables self-othering. Even when the dancer appears totally occluded by the dance, she and we always know that it is the dancer that will re-emerge when the dancing ends.⁴⁷⁶ The depth that arises between self and viscera is that between surface and interior and functions similar to Merleau-Ponty’s one hand touching another, yet his example has little sense of incomplete reversibility.

And before I let Leder and his viscera go, I must remind that Brian Massumi had a rather different interpretation of viscera. Here is what he wrote.

Viscerality, though no less of the flesh [than proprioception], is a rupture in the stimulus-response paths, a leap in place into a space outside action-reaction circuits. Viscerality is the perception of suspense. The space into which it jolts the flesh is one of an inability to act or reflect, a spasmodic passivity, so taut a receptivity that

⁴⁷⁴ We need recall the discussion related to proprioception initiated by Massumi’s work.

⁴⁷⁵ I have developed this idea in a variety of ways. Andre Leroi-Gourhan’s discussion of how body part, or entire body, can become tool through gesture is one important approach. I have also developed a concept of dancing as self-othering where I emphasize the self-transcendent aspect as well. See DCR, Ch on Self-Othering.

⁴⁷⁶ See further development of these ideas in DCR. ????

the body is paralyzed until it is jolted back into action-reaction by recognition. Call it the space of passion.⁴⁷⁷

Massumi's understanding of viscerality connects more with what we refer to by the term "gut feeling."

Dancing is a reversibility between dancer and dance, between self and other, yet it clearly is not a complete reversibility. While "dancer" cannot be without "dancing," without making a "dance," there is the constant awareness that the dancing may stop at any moment, indeed, must stop at some moment, and then the reversibility terminates. It is also clear that it is the dancer who will remain rather than the dance. The dance is ephemeral even as it is fully bodied. This hidden incompleteness is not the weakness of dancing, but rather the factor that energizes it, that gives it value albeit mysterious. In dancing there is always that hidden emptiness or space or chiasm that only movement can maintain. We experience the collapse of the experience of "pure depth" when a dance ends; so it is the sustaining of the chiasm or open place in the bodied moving action of dancing that is the ground for the possibilities for affordance, for evoking feeling and emotion.

Dancing is that reversibility that is necessary and must precede Merleau-Ponty's favorite example of one hand touching another. While he can see and feel that the hands are separate hands, he holds that being of one body unites them. Yet, it appears that he holds this only because he can see that the hands are connected to arms connected to a common trunk or because in the past he has made this connection and now knows this connection due to personal history. He also has given much attention to the intermodality of sight and touch; he should have known Ian Waterman. He does not acknowledge that we already know without seeing that our two hands are of one body because we proprioceive them before seeing them as two and distinct, yet of one body. I think this is the thrust of Irigaray's critique. We simply know proprioceptively that they are *my* hands because we feel them, feel them moving. While Merleau-Ponty understands the body as percipient-perceptible, it appears to me that this connection of the body to the world through flesh depends on the body being, more fundamentally, proprioceptive-proprioceptable, for this is the primal and pure depth that is the embodied chiasm across which reversibility plays. We must know, in the sense of feeling in our bodies, the distance of pure depth, before we can even place ourselves in the space of perception.⁴⁷⁸

Dancing is one of the most fundamental human experience of the distinctness and separateness of the other, the environment, because that gap between self and other is momentarily crossed in a transcendence that joins and in so doing creates the bootstrap, by which we come to play in that Möbiatic wonderland of perception, signs, metaphor, art, language, religion, and certainly everything else we might consider human. Dancing is the exercise and showing of "pure depth," if it is not the actual action in which our existence is constituted.

Very much consistent with the approach I am taking in this book, dancing, like movement and play, even as movement and play, has an incorporeal dimensions, an incorporeal

⁴⁷⁷ Massumi, *Parables for the Virtual*, p. 61.

⁴⁷⁸ This is what those newborn infants are doing in facial imitation.

dimension of the body, a transcendence that is experienced proprioceptively in ordinary acts. Whereas in the development of accounts of religion we seem unable to distinguish religion without including something of the transcendent—gods, supra-other, spirits, specials—I suggest on the basis of this discussion of pure depth and dancing that we have common and ordinary access to other and that religions build upon this commonness whereas academics have tended to isolate and rarify the other. My feeling is that the othering that occurs in any dancing, the othering that occurs in perceiving, is remarkable in itself and hardly needs mystification.⁴⁷⁹

There are plenty of examples that may help us see that, while western cultures tend to diminish the significance of dancing or to value it only to the degree it is commodifiable, others cultures and religions have a different perspective. The structural attributes of dancing, it would seem, are highly appropriate to religions. One example is provocative.

The Hindu figure Nataraja, a form of Shiva, is the lord of dancing. As depicted in the popular bronze images fashioned in the thirteenth century, Nataraja is dancing while holding in his hands symbols representing the five cosmic processes: creation, preservation, destruction, embodiment, and release. His dancing is not a part of these cosmic processes, but the primordial grounding upon which all these cosmic processes become possible. Yet, his dancing is the animating force of existence. His dancing is understood as *lila* or play and, as such, it is not done for any reason, but simply because it is his own nature to dance. As Shiva takes on the form Nataraja, this “othering” is done by dancing. It is the dancing form and action that identifies Nataraja. Nataraja, particularly the sculpted form, is the abstracted depiction of the cosmic forces that include complementary and opposed forces such as creation and destruction. Yet Nataraja, particularly as dancing, is the cosmic force at play in all its metastability (creation and destruction are copresent) and complexity. Dancing is the entwining form that experientially grounds what Merleau-Ponty called pure depth, and in so doing grounds both the separation and connectivity of reality that is fundamental to perception. It is also a sensory rich exemplification that perception is inseparable from vital force. That the dancing is play indicates the oscillatory nonlinear processes that give rise to, but inexplicably so, the force and existence of life. Dancing, self-moving, play.

That the ancient Hindus selected Nataraja and dancing remains of religious importance in Hinduism is compatible with the widespread popularity of the Nataraja figurine even outside of India and Hinduism. I suspect that this dancing figure invokes for many the energies that I have been attempting to show are connected with metastable nonlinear play. And dancing, as exemplary of Merleau-Ponty’s pure depth grounds perception; indeed, it grounds ontology.⁴⁸⁰

Dancing as “pure depth,” as play, as metastability, is the platform or primal condition on which are built the many dance forms that do have intention that take a specific form. Ballet and Javanese court dancing are highly codified dance forms that hold and show the

⁴⁷⁹ This argument will be made more fully in my chapter ??? I don’t want to be a mystic.

⁴⁸⁰ I develop this notion through the discussion of a number of philosophers’ works in relationship to my own dance theory development in “Dancing: The Naked Force of Genesis” (forthcoming).

most fundamental values of a culture; in both these cases, the culture of the court. On the platform of “pure depth” these dances create something like “pure ideals” for behavior, demeanor, comportment, presence, and value. The “other” presented as the dance is no real other, but an ideal other, yet, in its dancing it is achieved in real bodies, in real movement, in real presence, in felt experience. The ideal body of the dance is reversible with the quotidian body of the dancer; indeed, they are one body. Yet the reversibility is incomplete. The incompleteness is the depth that makes it possible for the dancer and those witnessing the dancing to experience and thus know the ideal. Experience related to dancing is always shaped by the constant presence of a kind of fragility. Dancing is perhaps so fascinating to us because it is always at risk of stopping. In dancing our attention is brought to focus on the fragility of moving being in no place; our experience of it is heightened because of it ever-moving. Dancing is the force of movement, the vital force, yet, as life itself, there is always a poignancy or delicacy due to the presence of the potential that it will stop. This fragility of dancing is the fragility of life. As Barbaras wrote of movement, “The living being is in movement, not insofar as it is living, but rather insofar as it is likely to cease living.”⁴⁸¹ I’d suggest that this amazing quality of dancing is evidence of its nonlinearity, the awareness that as dancing occurs it may be choreographed and set to music and utterly predictable, yet at the same time it always folds back onto its own emergence, its movement, the details of the process and the environment and thus presents the unpredictable. No two dances are ever the same. Dancing, in this sense, is always “live.”

It is of interest that children the world over dance before they speak.⁴⁸² Kids respond to the rhythms of their environment not with quotidian or purposive actions, but rather with that form of action that people everywhere identify as dancing. Surely this stage in child development occurs when kids proprioceptively experience the “othering” capabilities of their own movement; a kind of playful movement that, like Nataraja’s dancing, is not done for any reason, but simply because it is in the nature of children as forming human beings to do so. Such experiential explorations of play and depth occur at the stage in human development when the sense of self (ego) and the other is understood in the ways necessary to make possible the acquisition of language, metaphor, artifice, art, religion.

With these sorts of analyses we can appreciate why dancing is so commonly inseparable from religious and ritual acts. Dancing experientially grounds transcendence in immanence. It bridges the distance between human and other-than-human while allowing that distance and radical distinction to remain. Dancing is the experiential method of perceiving the religiously other. Dancing allows the “super-” or “supra-” of religion—a quality difficult to dismiss from the distinctiveness of religion—to be understood in terms other than apparitions or miracles or of familiar theologies.

It is an interesting issue that dancing plays such a minor role in the history of Christianity; indeed, it is often discouraged or forbidden. It can rightly be argued that, among religions,

⁴⁸¹ Barbaras, “Life, Movement, and Desire” 11.

⁴⁸² It is of interest that my granddaughter just began to walk and she did so as an outgrowth of her standing and dancing.

Christianity powerfully focuses on bodily experience.⁴⁸³ The incarnation, the resurrection, the crucifixion, indeed the whole of Christology, is inseparable from experience and these distinctive Christian markers ground the ritual and theological concerns that are deeply entwined with matters of experience. Christian theology and ritual foreground what I've been referring to as metastability; for example, death is life, bread is flesh, wine is blood. Yet, despite this large role of gross bodily experience, at least northern hemisphere Christianity has not engaged dancing either in its dominant imagery or in its ritual practice. What little dancing has occurred has usually been on the order of rhythmic walking or a modest swaying with accompanying praise gestures of upraised arms. I am not a scholar of Christian history and I remain perplexed that the church did not broadly embrace dancing. I believe it is an important question for Christians and for scholars of Christianity.⁴⁸⁴ Might it not be insightful to consider why, in place of dancers, Christian history is traced most closely with sedentary reading/writing males dressed in garments that render their bodies inarticulate? And it is clear that in southern hemisphere Christianity, currently the most rapidly growing area of Christianity,⁴⁸⁵ dancing is deeply important and widespread. I recall walking the streets of Accra on a Sunday morning hearing from blocks away drumming and singing coming from Christian open air churches and then seeing the worshippers energetically dancing. Dance and Christianity are deeply entwined throughout the southern hemisphere.

Perception is rarely a core concern of the study of religion. The common exclusion of experience and the sensuous as being allowed much relevance to the study of religion(s) makes concerns with perception peripheral at best. Yet, as I have attempted to show in this chapter, the revolution related to the understanding of perception that has been emerging especially since the middle of the twentieth century, have raised the most fundamental questions and offered remarkable insights about being human. Perception as movement is inseparable from vitality. Perception as transcendent is fundamental to how we extend beyond our physical boundaries as well as how we even come to know our own moving selves. What I have been eager to suggest is that rather than perception being peripheral to accounts of religion, perception engages fundamental ideas that, consistent with my discussion of movement and play from both philosophical and neurobiological perspectives, offer inspiration and core components to the development of an enriched account of religion.

⁴⁸³ See for example, Carolyn Bynum, *The Resurrection of the Body in Western Christianity, 200-1336* (Lectures on the History of Religions, No. 15) Paperback – April 15, 1995, who holds that Christianity may be the most bodied of all religions.

⁴⁸⁴ It is also interesting that in the last several centuries the court dance ballet has born ideal western cultural values; the values of the elite, yet certainly the example for all members of society. While ballet is not explicitly Christian and is not a standard part of Christian liturgy, it certainly is not alien to western Christian values.

⁴⁸⁵ See Edward R. Norman, *Christianity in the Southern Hemisphere: The Churches in Latin America and South Africa*, 1981.

Tradition

Ritual

Myth/Story (that essay I wrote)

Mircea Eliade's "The Morphology and Function of Myths," an essay in his 1958 classic *Patterns of Comparative Religion*, was important to my study of the Arrernte of Central Australia. My research⁴⁸⁶ wound up including an examination of the way Eliade constructed his classic example "Numbakulla and the Sacred Pole." This Aboriginal example was used frequently by Eliade as his principal and often only example for illustrating and establishing his account of religion, a theory of religion that prevailed through the initial decades of the development of the academic study of religion beginning in the 1960s. My research was energized by the criticism of Eliade exacted by Jonathan Z. Smith in a mostly successful effort to replace Eliade's theory of religion with one based more in careful historical analysis and to include an extensive role for comparison.⁴⁸⁷ Whereas Eliade's motivation was to discover "religion" as he had imagined it everywhere with cultural differences secondary to his essentialist view, Smith's attention was drawn to the distinctive cultural history with comparison in service to advancing understanding based on the importance of differences. Indeed, my study of the Arrernte was in part a family affair, a son eagerly attempting to avoid the murder of either of his beloved but warring fathers.⁴⁸⁸

Eliade's classic discussion of myth, written in this mid-twentieth century essay, now seems to me rather thin and unsupportable. Many of his references to religious cultures around the globe appear concocted, echoing the Australian example I know so well. In my research I documented in excruciating detail how Eliade drew selectively and creatively on Australian source materials to almost totally concoct a "primary" example from a "primal people" to support the view of religion he wished to establish. I documented that his presentation of the Aboriginals was in almost direct opposition to what a closer reading of his sources would support and to what can otherwise be independently documented as more closely and reliably ethnographically accurate; that is, if such a thing is even possible.⁴⁸⁹ I suspect that his extensive use of examples in this writing on myth in *Patterns* is of the same moth-eaten holy cloth.

⁴⁸⁶ See Gill, Storytracking ...

⁴⁸⁷ Jonathan Smith, ???

⁴⁸⁸ Both Eliade and Jonathan Smith were my teachers. And, of course, since Freud's *Totem and Taboo* (1913) was based in similar Aboriginal materials, this way of looking at my emotional stake in things seems especially appropriate.

⁴⁸⁹ Of course, there is much to be said for this impossibility and a looping back here from my conclusions would suggest that the creative and constructive role of scholars is perhaps greater than we have either admitted or have been willing to or had the courage to embrace. In important senses we create and discover our ethnographic others as we create and discover our academic selves; I rather like this looping interdependence. Yet, we

While Eliade's account of myth was for a long time so natural to so many, I now find it upsettingly disappointing and yet I still wonder at my own straying from the master. I think Eliade's view of myth is, at this point a half century later, an easy target for prompt dismissal. The language of his discussion of myth seems dated and, indeed, I'm not so sure that many religion scholars these days think much about myth in anything like the ways Eliade did. Still, eager to respect my elder, as I reflected further on his view of myth, on the presumptions behind his discussion of myth, and on the issues and data that are considered relevant to his study of myth, I am not so sure that things have actually evolved much in some crucial ways over these last fifty years.

In the context of the neurobiological bent of this book, I think it appropriate to use the term "efferent" to identify key characteristics of Eliade's understanding of myth (and by implication also religion). Myth, for Eliade, is archetypal, a "record" of the actions of the gods *in illo tempore*, not of this time or space, a justification for the way things are (and thus the truth). Eliade seems uninterested in the origin of myths, though he sees myth as always cosmogonic, as of the origin. Myth, as narrative, seemingly comes along as a god's handbook or a news report of the originating events. As has often been pointed out, Eliade has a decided disdain for history understanding myth as functioning to expunge the impacts of history through the eternal return to mythic times through the repetition of rituals that reconstitute the world of mythic origination, the pure or religious time and place. Thus, it is not particularly surprising that he has no interest in the possible historical origination of myth or in the history of the development of myth or in how the application of myth feeds back into the evolution of traditions of mythology. It is no surprise that he found Australian Aboriginals so important to his persuasive presentation of religion.⁴⁹⁰ He can speak of the degradation of myth, but he cannot speak of the evolution and creative emergence of myth over time. Myth simply is.

In one key passage in this essay on myth—it seems almost like a slip really—Eliade offers a surprisingly contemporary view of myth; one that even Francis Crick would have likely endorsed. Eliade writes, "myth is an autonomous act of creation by the mind. It is through

absolutely must bear responsibility for accuracy, as difficult as it is, in our study of actual others; not the least of reasons is that, no matter how insignificant our poor scholarship often is, it nonetheless impacts these actual peoples, present past future. In *Storytracking* I wound up presenting the Arrernte as a hyphen-conjoined reality to each of the major ethnographers who had studied them because I found that the perspectives of each ethnographer were so entwined with the ethnography as to make it impossible to distill the people from each ethnographer's distinctive interests and perspectives. Notably, Geza Roheim, the Neo-Freudian scholar who was most sensitive to these concerns and attempted to establish a field of psychoanalytic anthropology, was ironically the only scholar whose writings have been almost totally ignored because of a supposed inappropriate skewing (because he was a Neo-Freudian), yet my readings of his work have found them among the most important in many respects including that Roheim was very clear about what he was adding to his ethnographic records.

⁴⁹⁰ Remarkably Eliade's *Australian Religions* (1973, originally published as a series in *History of Religions*) is among the singular books on aboriginal religions, yet Eliade never went to Australia.

that act of creation that revelation is brought about—not through the things or events it makes use of.”⁴⁹¹ Eliade aligns himself here with those, like Crick, who consider the brain and central nervous system, alternately the mind, as the sole originator. In this leaked hint of Eliade’s understanding of the origination of myth, he clearly holds that perception, experience, the senses, and the environment play but a secondary role to myth. These comments come in the context of his discussion of vegetation mythology and his following sentence assures us that this efferent (initiated by the brain) pattern is indeed intended. He writes, “The drama of the death and resurrection of vegetation is revealed by the myth of Tammuz, rather than the other way about.”⁴⁹² Were Eliade around today (he died in 1986) he’d land in the midst of some rather fascinating debates at the core of cognitive science, neuroscience, and phenomenology; well, of course, he himself wouldn’t because such contemporary discourse is Mars-alien to his style.

Given Eliade’s sense of the primacy of myth, the functions of myth follow. Myth is the model for human action. Myth is the means that guides perception and makes what is perceived cohere, what is experienced with the senses. Without myth, sensory experience, indeed the environment, simply wouldn’t make sense. Myth is a way of knowing; perhaps *the* way of knowing. I believe Eliade meant this profoundly. Myth is the paradigm for perfection, the only measure of coherence (he called it meaning). Myth is the explanation and grounding for what is truth even if by the odd logic of tautology. Myth is the explanation and instructions for ritual. Ritual functions under the direction of myth. Myth is the story that grounds the feeling of coherence and holds the strategy for dealing with the presence of incoherence. One needn’t even study rituals directly since they are simply bringing about the coherence-creating forces of myth. Even in the peculiar paradoxes that Eliade acknowledges are fundamental to myth, myth functions largely to establish unity and perfection (the center and the origin are coincident with unity and perfection), resolving the oddities that come with creation such as separation and diversity. Myth seems to heal and to resolve what it appears Eliade finds rather embarrassing about the very acts of creation: division, separation, time, history, sex, will. We might restate Eliade’s position in more contemporary terms by suggesting that myth (the story) establishes the gestural patterning that grounds feelings of coherence achieved through correlation of myth with life experience. Myth is the measurant on which knowing, in some dependable sense, is even possible.

Without developing Eliade’s understanding of myth further, at surely a cost to adequacy and full responsibility, I hasten on to my point that his understanding of myth is through and through efferent by which I mean that the master plan of myth, which he equates with the mind and with the gods, has primacy, and overwhelmingly so, over perception, experience, history, environment, human plasticity and creativity.⁴⁹³ Even when Eliade

⁴⁹¹ Eliade, “ “ Patterns, 426.

⁴⁹² Eliade, 426.

⁴⁹³ That Eliade allows myth to be a creation of mind reveals a difficult, and to his view I think damning, issue if one understands “mind” to refer to human creativity. I would rather guess that Eliade likely intended something more like spirit or universal mind. To me, this mind origination of myth is the most fascinating issue raised by this current reading of his discussion of myth.

refers to “experience,” which he does now and then, he invariably refers to something like discovering coherence guided by compliance with myth. Myth, for Eliade, is the source of coherence. For example, when Eliade says that one experiences perfection in the paradoxical character of deities, I think he means that by exemplifying the unity of a single being with opposing traits such as male/female, creator/destructor, benevolent/vengeful, the deity demonstrates the perfection that is beyond division or opposition. The assumption is that any sensory human experience related to paradox would simply be confounding outside of the higher order, a mental order, a divine order, presented gesturally in myth that grounds a feeling of coherence, that is the ultimate basis of knowing. Yet, even this Eliadian sense of coherence, as I am arguing, is always immediately prone to degrading. This process of degradation is history for Eliade. It is by ritual and the myth of the eternal return that the vitalizing battle for coherence is waged.

Certainly while much has changed in the half century since Eliade’s publication of *Patterns*, I’m not so sure there has been all that much progress either in the academy or in the academic study of religion beyond this strongly efferent oriented approach to the study of religion that echoes the fundamental ways we understand such religious phenomena as myth and ritual; well even our general understanding of religion; even our understanding of the academic. I do not equate this efferent oriented approach with “textual” studies or to the prevalent methods of translation and interpretation. I think it a blunder to contrast text-based and body-based studies;⁴⁹⁴ it simply doesn’t divide up that way and to do so is to fail before we even start; the Humpty Principle.

A more promising possibility for revamping the way we understand religion is by comprehending that our methods, like neurobiological processes and coordination dynamics⁴⁹⁵ exist as dynamic efferent-afferent looping structuralities. Such an approach—one that is focused on process, perception, experience, plasticity, dynamics, self-movement, proprioception—can be taken whatever one’s basic sources or objects of study. Perception and experience and knowing must be recognized as essential even to language acts, including reading texts, and intellectual/mental constructs; they are essentially interdependent.

To exemplify an aspect of what I am suggesting I look to one of the simple givens of myth, its impossibles and the various forms that such impossibles take in myths that Eliade considers extensively. What I refer to here, Eliade does not, is the emotional reaction that accompanies this defining sensory marker of myth; impossibles; or I suppose I might better use a longer conjunctive term “impossibles-possibles” since they always implicate one another. Myths are about gods and spirits and monsters and dragons and tablets found in the back yard or on mountains that followers don’t see; all things that we don’t live among. Myths are set at times and in places that aren’t of our experience and that we can’t simply journey to with arrangements made by our local travel agent. The distinctive powers and behaviors of the characters in myth are outrageous and impossible for us, yet there they

⁴⁹⁴ This opposition of text and body is common these days as evident by Manuel Vazquez in both his book and his recent CU visit.

⁴⁹⁵ In the study of religion Mark Taylor’s discussions of certain forms of self-adjusting networks offers the closest to coordination dynamics. (cite his work)

are, always there. These impossibles are—I suggest, particularly when they are presented so unapologetically as rather matter of fact—the main attraction of myth and one of its principal markers.

I can't see any alternative to understanding myth, a language-based form, other than as a human creation, a genre of oral and sometimes literary⁴⁹⁶ tradition with its own history and with given examples, that is specific myths, having their own histories, their own traditions. Therefore, these "impossibles" must occur so commonly as characteristic of this genre only because the human mythmakers and myth modifying tellers constructed them that way; I can't imagine an alternative at least outside of myth itself. Interestingly the Internuncio originally were employed by the pre-printing-press church to take messages to and from the outlying communities. One would imagine that they exercised considerable influence on church affairs as the product of their memory capacity and their personal interest in shaping the messages they carried. Frankly, I think for most who have told and heard myths these "impossibles" are fundamental to their being "fun" and holding our abiding "interest" and key to their being memorable. To endure, myths must be good stories. The unexpected and the unexplainable are what delight. What I think academics have sorrowfully misunderstood, and I think they inherit this from an oddly Christian-beholden heritage, is that the mythmakers, myth-tellers, delight in creating and embracing precisely the construction and elaboration of impossibles that defy resolution. I say sorrowfully misunderstood because of the obviousness of the fundamental impossibles of Christology—god is man, death is life. Academic students of religion, devoted to the same efferent intellectual sedentary male ecclesiastical power-based model so central to Christian intellectual/church history,⁴⁹⁷ have devoted their total attention to making sense of, to giving reasoned meaning to, to attempt to resolve those very attributes of myth that their human creators so delightedly interwove into them, surely.⁴⁹⁸ No wonder Christianity has had such a difficult time trying to even determine if it has myth and what to do with it if it does. Myth in the Christian context tends to be an embarrassing and shockingly primitive (irrational) phenomenon.

⁴⁹⁶ Walter Ong has the greatest insight on this matter in his *Orality and Literacy*.

⁴⁹⁷ Doubtless many of you better informed about Christian history than I am, which I suppose is all of you, will surely want to kick my ass for this broad generalization; have at it. Should I include all the polite and appropriate academic qualifications, I'd lose the emotional point of it.

⁴⁹⁸ This comment is placed in a footnote only because I don't have the time to work it into the above narrative in anything like a graceful way, but what students of religion seem to fail at miserably (my view of course) is that religious folk simply love to recite and listen to these stories; they can't hear them often enough and it ain't, as Barthes seems to imply if I understand him at all, that the overplus of myth, its repetition and endless redundancy, is to make it finally possible for the auditors to "get" the message (suggesting inherent stupidity perhaps), but because it is fun and entertaining and delightful and poetic and also because for myth-tellers and myth-listeners it is "our story;" this story is "our story!" Maybe I should invert this narrative device and make this footnote the main text of this essay with all the rest a footnote to it; that could be fun too.

To return to the “impossibles”—what Eliade considers in such terms as “paradox,” “*coincidentia oppositorum*,” and “one and the many”—I want to explore the implications of embracing them without seeking final resolution or explanation or signification or even the meaning in the italicized *the* big M form of the term,⁴⁹⁹ and appreciating how impossibles are experienced; experienced more in the sense of perceiving and knowing rather than in the sense of intellectual explanation. An impossible is basically to proclaim identity of what is clearly known not to be identical; a conjunction of “is” and “is not,” a categorical anomaly taken for granted. To identify a figure as both male and female, as benevolent and malicious, as god and human, to say that death is life, to say that poor is rich, to say bread is body, and so on, these are all impossibles. Linguistics has long held that we understand words in terms of what they are not, what they exclude, as much as by what they are, what they include or reference. These storied impossibles engage the process the play of oppositions to the service of knowing. I like, as is surely predictable by now, to refer to this structurality of impossibles as the interplay of a twoness that is always also a oneness, copresent implication. I suggest again, as I did above, that this conjunction constituting impossibles is one of the principal markers of myth, yet I think it ubiquitous actually to human perceiving and knowing and to human distinctiveness.⁵⁰⁰ Myth presents impossibles in a narrative style with particular and distinctive traditions of conventions. Yet, impossibles also are the core structurality of play, of metaphor, of dancing, of seduction, of art, of language, and so forth with so many things human. As considered above, metaphor, more common than common, as common as dirt, is the equation of two things that we know full well are distinctly not the same. In all of these forms, we declare in all seriousness that something is what, in the simplest and most elemental terms, we know it is not. What we must appreciate is that this is the very condition of movement.

Academic students of religion are often irritated by the common popular use of the term myth to refer to things that we all tend to think are one way (we often say “true”) but, in fact, they actually are not (we often say “false”). I think that this quotidian understanding of the term myth is likely an outgrowth of the way modern academics and Christians have tended to approach “impossibles” and that is to resolve them or to “bust” them or to expose them. Even this common understanding of myth juxtaposes and thereby embraces the true and the false. Surely we must see that, far more fun than being set straight by having a myth busted, is to continue to hold the impossibles possible simply because we get

⁴⁹⁹ There is, I believe, a major difference between something that is meaningful, that is full and overflowing with meanings, and meaning in this big M sense of “the meaning” which is always reductive and, to me, dismissive and disappointing.

⁵⁰⁰ Applying the efferent/afferent looping structurality at every concern, I find myself increasingly interested in both the sameness of humans among all animate organisms (because we are all movers and proprioceptors) as well as in what distinguishes us humans among our brother and sister animate organisms. The first arc of the loop places us in the fellowship of enormous diversity while the second arc moves in the direction of establishing a “naturalist philosophical” basis for cultural/religious comparative studies that must be grounded on some common neurobiology. Importantly, as a looping structurality, this approach to study is not directed to some end, but rather to the constantly creative oscillating movement that is satisfying.

something out of doing so; the delight, the joy, of holding two opposing things together as identities knowing they are not. Hooah! And, remarkably, we then generally find all sorts of wisdom, application, and relevance to these impossible possibles in our daily lives; an authoring, in this case our lives, wrought of the inspiration we find in myth, story, prophecy, astrology. The power of myth is in the movement/touching engendered in the embracing of the dynamic of the twoness that is always also a oneness, copresent implication, rather than in some resolution of the impossibles into some possible or likely which is invariably accomplished by overpowering the efferent/afferent loop with an efferent proclamation that posits some turkey-bacon⁵⁰¹ style explanation for something being what we all know full well it isn't.

It is my sense that the mythmakers and the myth-players have always delighted in the impossibles, not to resolve them, but rather to be "moved" and "touched" by them. Ah, and this shades us into another aspect of these impossibles, the emotional/feeling aspect of them. From the chiasm of the impossibles, from the yawning yet ever so tantalizing gap, arises emotion and feeling; poignancy and pain, longing and love; yes, lust too. Just think about that quintessentially Christian term "love" for a moment. In whatever of its forms, love can mean little outside the poignancy of the conjunction of the two—implying separation and distance and longing and loneliness and lust—and the one, the desire, the urge, the need to be one rather than two. The immenseness of the feeling associated with love is that the connection, the unity, is always in some sense unfulfilled; the twoness always persists. Love would be simply lost in total singularity or identity or unity; love demands an object, an other. Love then is an emotion of a twoness that is always also a oneness.⁵⁰²

What is so remarkable about inner touch, proprioception, living movement, self-movement, that is the very quality of the experience of "impossibles," is that these are experienced as a feeling kind of knowing. We know things based on moving because of the feeling accompanying moving. We actually feel the self-moving rather than the backfilled task accomplished by an act of movement. Myths move us at our cores; myths evoke our vitality, our self-moving feeling kind of knowing. Our stories, our own stories (especially those stories so richly laden with impossibles that we call them myths), move us, affect us so profoundly, unlike the stories of others that we might occasionally encounter, because in the familiar tellings and hearings, in the retellings and rehearings, in the repetitions and recitations where telling and hearing become inseparable, in these story tellings/hearings

⁵⁰¹ This term is inspired by the Christian theological efforts to explain the presence of the body of Christ in the host of the Eucharist in the terms that hold that while it may look and taste and smell and feel like bread, it is really really the true body of Christ; turkey bacon. It also reminds me of my former son-in-law who was a Senegalese Muslim who was so thrilled when he discovered "turkey-bacon." I'm wondering what the Muslim theological position is on this matter.

⁵⁰² Another quick and obvious example of the most quotidian variety is the attraction we have to riddles. We delight in riddles not to resolve them like problems so that we might move on, but because of the duplicity and misdirection that always forces us to find ourselves delightfully imposing impossible frames on one another. Jokes work in a similar way. And on and on and on . . .

that are also actings and gesturings and dancings and ritualings and socializings and mournings and celebratings and commemoratings, in the richly synesthetic experiences drenched with smells and tastes and sounds and sensations that fill our lives, in all these ways and so many more our stories become implanted deeply in muscle and ligament and nerve (in synaptic criteria) as the rhythms and flows and movements of our gestures and postures and feelings that make us who we are.

Throughout religious history story has been the genre most prominently the spine of religious tradition. Story is not only a basic technique for the transmission of religion and culture; arguably it is, more so, a way of knowing and remembering. The overwhelming majority of religious people throughout history has been exclusively oral and thus has relied extensively on storytelling to learn the details that comprise the distinctive identity of their religious traditions. Sacred texts are commonly collections of stories or songs or poems or parables or tales. While traditional distinctions between the genres of myth and folktale have usually correlated with the type of culture and academic discipline, they are both fundamentally storied and narrative forms.

Students of religion have commonly approached story, whatever its specific form, as text and submitted it to interpretive analysis to discern the theological, historical, and cultural principles or concepts that are somehow presented through this medium. This approach is a retrograde movement that halts the vital movement inherent in the story genre, particularly as it occurs in religious cultures. Folklorists, such as the approach developed by Dell Hymes and others,⁵⁰³ have focused more on the performances of stories, on storytellings. This performance approach has attempted to appreciate the living processes of storytelling and how storytellings are invariably applications corresponding to specific contexts. And, of course, religious peoples whose religions are based on text interpret and apply text to present concerns.

Students of religion have commonly felt ambivalent about story forms and I believe that the ambivalence correlates with misunderstanding the most powerful aspect of the story, understanding it rather as untrustworthy and suspicious. The thing is that story cannot be separated from a kind of ambivalence, if one chooses to see it this way, between being true and false, between being made up and often concocted of wildly imaginative elements and being revelations of the truths about reality, this reality.

I have occasionally written about the word “story.” I accepted the invitation to revise my book *Native American Religions* for the sole reason that I wanted to include some of my stories as a little experiment on story.⁵⁰⁴ In the epilogue of that book I wrote, “I particularly like the ambiguity of the word story. It is commonly used to refer to myth, folktale, anecdote, history, as well as an out-and-out lie. Often we never know.”⁵⁰⁵ It is the never

⁵⁰³ Dell Hymes ???

⁵⁰⁴ Frank Hamilton Cushing did folklore experiments of a subtle kind when he lived at Zuni. He told them European folktales, the story of the “Cock and the Mouse” to be specific, that didn’t exist at Zuni and awaited to see how they would be incorporated and zunified by the Zuni storytellers.

⁵⁰⁵ Sam Gill, *Native American Religions: An Introduction* (Wadsworth, 2nd ed. 2004), p. 129.

knowing that I most love. Where's the fun in finding out? I wanted, by telling stories, to raise the issue of ambiguity that seems inherent in story, as the source of its power.

My experience with the Navajo was a wonderful introduction to story. They spend enormous amounts of time and energy telling and listening to stories. There are stories about everything. They include such figures as Enemy Slayer and Born-for-Water and Talking God and Calling God and Changing Woman and figures of endless varieties and personalities. Navajos also delight in an enormous repertoire of stories of coyote, the trickster, and his many exploits. These stories have often been considered by non-Navajos to be "mere" entertainment (often off color at that), but Navajos see them as completely entertaining and delightful but as also essential to the education of Navajos. They are considered educational in at least two senses. First, they reveal Navajo values and traditions that are essential to Navajo identity. Second, they are commonly used as correctional tools. Improper behavior may be addressed by being correlated with a specific coyote story. The story may even be adapted to be clearly relevant to the behavior being criticized. It is fair to say that there is little in Navajo culture that isn't related in some way to a Navajo story. Further, Navajo songs are often based on Navajo stories; Navajo ritual is performed in terms of a specific story tradition. What is so clearly distinctive of Navajo stories is that they are comprised of the most unbelievable figures and events, when reckoned in terms of ordinary human behavior, yet they are applicable to and fundamental to the living identity, behavior, and experience of everyone who could properly understand themselves to be Navajo. Navajo stories are impossible possibles, lies that tell truths, otherworldly (or mythic) yet vital to this world (quotidian). Navajo stories are closely guarded to assure accuracy in their tellings over time. Navajo stories are transformed through their tellings (performances) in their every telling; every telling being an application in some sense. Yet, Navajo stories are considered to be stable and passed through generations without change. Most serious stories begin with the storyteller reciting the lineage of storytellers in which he exists as a way of providing assurance that the stories are authentic and stable. Story is knowledge about this world, about this life, that is presented as knowledge about what is not of this world, not of this life.

Story, including its various forms such as myth and folktale, aligns well with the structurality I have been presenting again and again throughout this book. It is the characteristic metastability of story, and its refusal to resolve this metastability, that is the source of its power.

To approach story as a veiled or poetic presentation of meaning—meaning that can be discerned through scholarly interpretation—seems to me to shortchange the power of the genre to be generative across time and among endless possible applications. To prefer history to story because of a distinction between history as presenting objective reality and story presenting the fictive or imaginative seems to me to misunderstand both myth (story) and history. It misunderstands myth as being somehow merely fanciful and unreliable. It misunderstands history as being somehow thoroughly objective and apart from constructive narrative processes that are always at play. The distinction may have more to do with the self-reflective style inherent to the two forms than it has to do with their relationship to reality and truth, if we like such a term. And story is a way of

embracing history. N. Scott Momaday once wrote that people can endure anything if it is rendered into a story.

Memory

My granddaughter prides herself in her belief that she has what she terms a “photographic memory.” While she is also an excellent reader and can, indeed, recite a story she has read in detail including the dialog, I think I’ll wait a few years before I introduce her to Jorge’s Borges’s “Funes the Memorious” that takes literally the downside of a prodigious memory.⁵⁰⁶ Someone I have known for decades has recently been diagnosed with Alzheimer’s and is clearly suffering from progressing memory loss, memory confusion, and the enormous range of physical effects of this disease. The other day I talked with another woman I’ve taken step aerobics classes with and she explained to me that she feels that diet is important to memory function and that despite her excellent diet she experiences some memory “fuzziness” now and then. Many of my age peers (even folks decades younger) joke about their loss of memory and I find it quite amazing that so many simply embrace the cultural expectation that aging leads inevitably to memory loss. There is scientific evidence supposedly (like from Johns Hopkins University and many others!) to support this belief, yet I’m not so sure it isn’t a product, to some degree, of how the culture is neurobiologically constructing itself by practicing the progressive limitation of self-movement activities as we age. And, of course, this being the century of neuroscience the brain is now a principal character in contemporary cultural fiction, opps I mean non-fiction, everything these days seems to be about the brain and clearly the major focus of the studies on the brain and the largest motivation for studying the brain is memory.

My father died a few years ago at the age of 91. He did have an exceptional memory to the very end. In recalling events from his past he’d often include things like the bushel price of wheat at the time, perhaps fifty or more years earlier. Yet, he never recorded any of that information. Surely most of us can recall the gallon price of gas when we were teenagers first driving (eighteen cents for me!). For years before his death I thought frequently about the importance of getting him to record some of all that information and stories. I even asked him to do so, yet he never did; I rather think he couldn’t imagine why one would need to record something when it is so readily available in memory. I remember thinking that upon his death this entire nearly century-long lifetime of memory would simply vanish forever (like a light going out); and it did. What a disquieting image: one day a lifetime of memory all available for recall, the next day nothing but dead brain cells.

When my mother was old, she’d often laugh when telling a story from her past. She’d explain that since she was now the only one alive that was present at the event she was remembering, she had considerable freedom in recounting it without risks to her credibility and authority. She said it more poetically, but that’s gone too.

Yet, let’s think about this a moment. Merleau-Ponty and others have been convincing in showing that our perception is not like a digital camera (expanded to our many other sensory inputs) recording sequences of images/sensory experiences that can then later be

⁵⁰⁶ Jorge Borges, “Funes the Memorious” ????

flipped through like a box of old photos (hmm, a set of digital images or sensory records) when we want to remember something. I understand it is a much more interactive process and that memories are both fixed in some measure and they are also plastic, thus subject to change as they are recalled and perhaps even as they are stored. Memories in their plasticity are rather like dreams, as I read Raymond Gibbs⁵⁰⁷ and others, in that the mere act of remembering seems to alter the memories themselves. Furthermore, should we have the equivalent of those digital memory files somewhere, we'd still need some integrative mechanism to reconstruct the images/experiences for our later reflection; something like an entire set of inner senses that would work on this inner memory landscape.

Our “now” experience (experience in the sense of what we are sensing and experiencing in the present) is transformed into neuronal groupings (in processes described by Gerald Edelman and others) in various ways to provide both the synesthetic marker of the whole now experience that may be subject to recall as well as to integrate now experiences with endless other relatable experiences that have contributed to constructs of accumulated experience through repetitions of similar now experiences. This double face of experience—the present and the cumulative—is a major function of neuronal pattern formation, development, and use. Importantly all of it is present, even if it includes markers of pastness. I develop this idea of the richness of the present in terms of what I call the “fat present.”⁵⁰⁸

Like so many things that I have developed in this book, memory is a copresence of pastness and presentness. Memory has to have a distinctive “past” marker for it to qualify as “memory” and cohere with notions like “recall” or “remember.” These “re” prefixes remind us of the metastability that is inseparable from memory, that is, a past that is also present, but not. Yet, we also know that memory isn't replication, it isn't as my granddaughter labels it, photographic. This is the insight Borges's Funes taught us. His memory was literally photographic in the full synesthetic and temporal sense, so that his “remembrance of things past” was in every sense identical to his original experiencing of them; he couldn't distinguish a remembered experience from a now experience; of course, a remembered experience is a now experience with a marker of pastness and I suppose that it was this marker that Funes couldn't discern. Major remembrances of things past produce memoir, autobiography, story, fiction. Borges's by giving Funes what we so often crave, a prodigious memory, shows us that we don't really want what we wish for. Thinking, we learn from Funes, requires forgetting. Memory then and recall are not literal but highly reprocessed thinkings and reassemblings and accumulations and blendings marked by temporal copresence of past and present. Were memory total recall it would no longer be memory, it would be a wrinkle in time unknown to us.

Memory, like concept and category, is comprised of neuronal groupings formed through synaptic connections thus linked not only with the axon/dendrite connections but also the synaptic criteria. One distinctive neurological issue related to memory is what aspect of the chemistry of synaptic criteria keeps memory stable without alteration over time; as in my dad's case sometimes a very long time. This is the issue of what neurological

⁵⁰⁷ Gibbs, Raymond. *Embodiment and Cognitive Science*.

⁵⁰⁸ See my forthcoming *Vitality* ... chapter “Fat Present”

mechanism is operative that allowed my dad to remember the bushel price of wheat fifty years later. Another distinctive neurological issue relates to recall of memory. How is it that memories are so often, but not always, revised and reconstructed in the process of recall? This is my mother's awareness that her recollections are in some ways reconstructions. Memory is distinguished by the copresence of its stability and its malleability or plasticity. Memory is the very marker of time, yet is itself unaffected by time. Memory is the copresence of the past and the present.

Nobel laureate Eric Kandel, neuropsychiatrist, and his student Kausik Si have attempted to learn some key features of the neurobiology of memory. When a memory is formed there needs to be a connection maintained at the synapses in the neuronal grouping forming the memory; the persistence of the memory depends on the maintenance of the synapses, yet the molecules that maintain synapse have a brief lifetime (shorter at least than the memory). The issue as stated by Kausik Si is, "How can you create a permanent state with molecules that are going to disappear within two months?" I suppose this would be something like how can a printed word exist if the ink and paper disintegrate in two months? The best evidence they found indicates that a protein called CPEB, for cytoplasmic polyadenylation element binding, has the necessary properties to keep a synapse activated. Si, working with yeast prion specialist Susan Lindquist, showed in 2003 that CPEB acts as a prion. Prions are rather "infamous" cells associated with "mad cow" and neurodegenerative diseases, yet the prion has the ability to self-replicate apparently perpetually so that once the prion's chain reaction gets started the synapse can be maintained perhaps for a human lifetime.⁵⁰⁹ The replication persists in a sense apart from time to retain the synaptic base of memory.

While memory has stability over time, the ongoing accumulative nature of experience, knowledge, and concept formation continually builds reentrant connections among memories and other neuronal groupings. Such constant development of connections within and among neuronal groupings impacts the processes engaged in recall. We don't simply recall the factoid element of memory; we connect with the memory and the networks of neuronal groups that are constantly changing. Memory is then connected with knowing in both the sense of persistent presence of the past as well as the constant reconstruction of the knowledge marked as "past" or "memory" in the process of establishing a sense of the coherence of the present. If memory were only the perfect presence of the past, we would suffer the affliction of Borges's Funes and be incapable of thought or really anything at all (Funes had to confine himself to a dark room). If thought did not have an anchor in memory, then we would also be incapable of thought; perhaps something like the sufferer of Alzheimer's. It is the nature and power of memory to be both reliable and stable and accurate while also being modifiable and flexible and open; a necessary copresence.

Memory is such an interesting notion in the human organism. Memory does not exist other than the present, though I think a fat present for sure; that's the importance of neurobiological consideration of the prions that hook memory always to the present.

⁵⁰⁹ Beth Skwarecki, "Prions Are Key to Preserving Long-Term Memories" *Scientific American* Feb 18, 2014.

Another way to say this is that memory is always of the living; the dead no longer remember. Memory is part of the mechanism of knowing that gives richness and depth to the present. Memory and accumulated experience have markers of past time, but they are felt and known to be present in their availability. Even those moments of recall or forgetfulness are evidence of this presence; we know we know, we just have to await the manifestation of what we know into consciousness.

We often study religions historically. We use retrograde academic methods to chart change and continuity across time. Yet, we might be inspired by this account of memory to consider that tradition for religions and cultures functions something on the order of memory in service to knowing for the individual human. Were we to consider religions and cultures as complex self-adjusting networks that function on the order of organisms in having their own needs for coordination dynamics, then we might see that tradition is the aspect of the present that is marked as past and functions dynamically in ways similar to recall and remembrance. Stories and rituals, among other things, have important roles in this process of knowing, maintaining knowledge, and applying knowledge.

Text

Concept/thought

Materialism (reflect on Vasquez and on issue of matter/corporeal concepts)

Manuel Vasquez's *More than Belief: A Materialist Theory of Religion* (2011) offers a broad historical context for positioning the advancement of the academic study of religion and culture and he goes a long way to outlining how that new face of religious studies might look. His goal is to "lay the epistemological bases for a flexible yet rigorous non-reductive materialist framework for the study of religion. . . . to overcome disabling dichotomies in religious studies that have privileged beliefs over rituals, the private over the public, text and symbol over practice, and mind and soul over the body."⁵¹⁰ He supports an activist approach that focuses on what religion does and how religion exists broadly across cultures and history. He focuses on practice without excluding even the writing, reading, and study of texts and scriptures.⁵¹¹ He eagerly invites analytic and descriptive perspectives across the scope of those academic fields that offer insight into human behavior including not only the humanities, but also the natural sciences. He helps us understand from the perspective of the complex history of the field why we have found so many of these tasks so persistently ornery and contentious and he cautions against allowing those types of explanation that find a single system or principle or mode to constitute a suitable and sufficient explanation for anything at all, much less the complexities of the likes of religion.

⁵¹⁰ Vasquez, 321

⁵¹¹ Vasquez, 255-6.

I find Vasquez's book to be both a well-informed and careful analysis of the enormously complex turf on which we all come to play these days and also an inspiring playbook that we should take seriously for the healthy growth and development of the future study of religion and the humanities. I hope that what I am presenting here offers some explorations that fulfill some aspects of the spirit of Vasquez's insights.

There are several things I would like to add, continuing the discussion inspired by my mystical character, to the discussion reaching out to engage Vasquez's terms. As it is clear, my work here is focused on, begins and ends with, movement (self-movement). Movement is an implication of many approaches Vasquez discusses, yet the closest he comes to actually referring to movement is in his discussion of *habitus* (especially his discussion of Pierre Bourdieu and those who have attempted to extend his work) and action which he draws from cognitive science introduced by Francisco Varela. Vasquez includes a section on Marcel Mauss focused on his important 1936 essay "Techniques of Culture"⁵¹² where he acknowledges that the techniques Mauss was talking about have cultural, historical, and psychological aspects; yet the enormous importance of Mauss's work as it relates to movement and gesture is not developed further. Vasquez does not recognize Mauss's techniques as action, as movement, or as gesture. Indeed, neither gesture nor movement is in the index of Vasquez's fine book. He discusses "mobility" but understands this simply as the movement of religions from place to place. In his 2008 book *Crossing and Dwelling: A Theory of Religion*, Thomas Tweed's discussion of movement related to religion has a similar understanding focused on migration and diffusion. And in his conclusion, Vasquez notes that an "important dimension of material religions I left mostly unexplored is connected to performance"⁵¹³ by which he names dance and theater as examples, yet surely every material object engages performance (which is movement) in its making⁵¹⁴ and use.

Now the reason I note Vasquez's lack of attentive awareness of the role of movement is not that I distract from his powerful and promising position, but rather because I want to attempt to relate how what I am doing in this book relates to and perhaps fulfills in some measure his insights and recommendations. An enormous amount of Vasquez's book focuses on patching up the difficulties caused by the long history of exclusive dualist strategies of categorization, analysis, explanation, perspective. Frankly I've spent a large part of my academic life attempting to do the same thing. The problem that I have discovered is that no matter how great an effort one makes to put back together what centuries of language use, habit, gesture, and category have rendered asunder, you never get results that are more than a patch-job; this is what I've called the Humpty Principle. It is the seeming inevitable associations with dual pairings that so bother me in the consideration of my mystic. And, of course, as soon as Vasquez outlines that he is attempting to add emphasis to the ignored member of the many faceted dualities, he immediately has to try to say that that doesn't mean he's opposed to the other. What a mess!

⁵¹² Although Vasquez's citation would suggest that it was published in 1979)

⁵¹³ Vasquez, 327

⁵¹⁴ One thinks of Elaine Scarry, *The Body in Pain* (???)

What is needed is a preemptive strategy of moving and playing; one that precedes, logically more than temporally, the separation of these opposing dualities. Were that possible, and I'm making every effort to show that it is, then the later or subsequent rise of oppositions or categories or gaps or distances might be understood as a way of playing out this pre-dual condition rather than leading to the sorts of narrow-mindedness and unhealthy conflicts that these dualities seems so frequently to engender. We could then, as I've enjoyed doing throughout this book, celebrate the exploration of moving and gaps and play and seduction and the impossibles of stories and the falseness that presents the truth of myths with the greatest motivation to keep the constituents of religion open and moving and at play.

Certainly my long time study of play has inspired this view. My current studies of the philosophy of movement, as well as its neurobiology, inspire this approach. My appreciation and marvel at the extent to which animate beings are constructed on the model of synaptic gaps managed by synaptic criteria contributes at an entirely different frame. And another important inspiration for me is the twining of touching (exterior and inner) and moving achieved by proprioceptors. Massumi and others speak of them, yet with perhaps too little attention to the neurobiology. In talking and writing about proprioceptors I feel it essential to know, at the level of at least general scientific description, what these things (that exist by the billions throughout our bodies) are and do. Proprioceptors exist where the nerves and muscles are so integrated that it is only a matter of what you want to understand about them that determines whether you describe them as of the muscular or the nervous system. This is amazing; proprioceptors are logically and functionally prior to the duality of body/mind; indeed, they give the lie to the distinction as at all radical. Proprioceptors are both muscle and nerve (at once and inseparable), both body and brain (nervous system), and the only thing proprioceptors are about is movement and, as importantly, the feeling and awareness of movement in touch with the environing other. Given the obvious—that life and movement are synonymous—then there you have it. One would never enter an argument about to which system proprioceptors (movement) exclusively belong. One would never indicate that the brain controls the body at the level of proprioceptor; or vice versa. Our starting point, it seems to me, is life and we can get at that by recognizing that life and movement are synonymous. And importantly, all else comes as a product of what interests us about life. My attraction to my priest/mystic character is simply his vitality. We are organisms, animate organisms, we move as the condition of life, and the exercise of life, and our felt awareness of our life is an awareness of our animateness.⁵¹⁵

Now Vasquez focuses on “matter” as the core of the study of religion because he believes religion is, as his title indicates, “more than belief.” I completely agree and I think that, as I understand Vasquez on materialism, he also means religion is “more than stuff.” I believe that, as he focuses on action, on practice, on *habitus*, and so on, that he is not so interested in just stuff so much as he is interested in how “stuff” reflects and effects human action and power and agency and value. Yet, there again is the Humpty Principle; by labeling his approach “materialism” and contrasting it with “belief” and implying a hierarchy with the

⁵¹⁵ This strategy of development is extensively developed in my forthcoming *Touching Moving Sensing*.

words “more than,” it seems that he never escapes the sucking vacuum of the unhealthy dualisms he so scorns and his work, effective as it is, takes on the style (as do unfortunately these several paragraphs I’m now writing) of contention and conflict, even though he does it with the remarkable grace and fairness that is his character.

My sense is that were we to carry out Vasquez’s materialism it would be along the lines of “making” and “seduction and production” and “playing” as I present them in this book and in *Dancing Culture Religion*; or the consideration of acts like dancing that make but don’t produce “stuff.” Even more importantly to fulfill what I believe to be Vasquez’s vision and to remain focused on stuff is the development of a complex and sophisticated theory of “prosthesis” which I am also working on. In other words, starting with and persisting in a consideration of movement, self-movement, living-movement, movement in itself, engage stuff without excluding belief (to limit to this one duality) in service to the exploration of vitality.

One other point that I have been thinking about a good deal as I am trying to relate the contents and my interests in writing this book to religion and the study of religion is that I think it makes an enormous difference whether one begins what one does located with “religion” as one’s specified topic and with the “academic study of religion(s)” as one’s specified approach. Surely that is how my fascinating character was identified as “mystic” in the first place; a “religious man” labeled him. If we start as “insiders” (religion is what we are about) then we feel some obligation to making some distinction of what religion is and to do so in conversation with the history of this academic field. I suggest that we are so naturalized to the discourse that it is difficult to even comprehend the possibility of any other. This familiarity will invariably tip the discussion towards “religious” perspectives on “academic” matters because that is the tradition, the history, of this discourse. One must then feel obliged to engage in a discourse based on belief or theology. Vasquez, for example, makes an effort to avoid the discussion by the bold declaration of his preference for “immanence” (obviously consistent with his materialism), yet his very choice of the term immanence necessarily draws him into defending his position against the history of assumptions that religion is designated by something transcendent. And even when it is acknowledged that scholars are not in the position to observe or verify the “transcendent,” as does Ann Taves, her proposed resolution is to settle for the “deemed” and she goes for a broadly euphemistic generic for god (all the various transcendents) by using the term “special.” Students of religion, trapped by this theological pre-disposition, then get very protective about who has rights to their turf and what sorts of explanations might be acceptable. Vasquez constantly discusses what sorts, if any, of reductions are acceptable and he clearly shows that he realizes that he is going against a strongly held position (as does Taves) in constantly suggesting (ever so gently) that those natural science folks may not be totally irrelevant. I couldn’t agree with both of them more.⁵¹⁶

⁵¹⁶ A notable example of this dual-blindness (that is, being unable to see anything other than in oppositional dualities) occurs in Vasquez’s discussion of Jonathan Smith’s critique of the “locative,” or center/origin orientation so common to the academic study of religion. Vasquez discusses Smith’s introduced term “utopian” and discusses it as contrasting with “locative,” yet he does not acknowledge that Smith went further by suggesting a third

I confess that my first interest is no longer strongly focused on religion or the academic study of religion, but more broadly on the appreciation of the wonder and complexity of being human. I am simply in awe of the complexity and richness and unpredictability and unfathomability of being human and how our humanity is both in continuity with and distinct from other animate organisms. I am endlessly excited that we are moving creatures and that we feel ourselves moving, that our feeling of ourselves is linked to our moving. Frankly, the more I know about being human from a natural science perspective the more in awe I am of my own humanness and aliveness.

So what then does religion look like from this “humanist” “naturalist” movement-centered perspective? Well, certainly it is one important historical and cultural form of enactment of human capacities and distinctivenesses. Yet, it isn’t superior to or in any way privileged among or different in kind from the many other arenas of human action and behavior; nor is it entirely separable from them. All the markers of religion—gods and creatures of myths, texts (scholarly and canonized and historical), practices (ritual and quotidian, conscious and habitual), organizations and individuals, stories and traditions, books and buildings, wars and scandals, brutalities and generosities, narrow-mindedness as well as perennial universalisms, the fullest range of experiences emotions intentions and motivations; all of these and more—are of interest. For me, one of the most fascinating things about religion is the patently obvious incredulity and irrationality and over-plusness that seem so closely routinely connected with it. To comprehend all these things from as many complementary and interrelating perspectives as possible, including every academic and folk perspective should only enrich our fascination and interest. We study religion, as we move our bodies, not to resolve and grasp and define, but to thrill with the joy of life and the opening of distances that invite movement. I don’t want to be a mystic.

Transcendence/Other

[from other ms] the advantages and implications for studying religion from a perspective sensitive to living movement, movement understood as copresence, and we recognize also that neurobiology is as valuable in understanding movement as is philosophy, then it seems not only incumbent on us to take neurobiology seriously but to also engage it as fully as we can in expanding our understanding of movement. Inspired by the developments in neuroplasticity, French philosopher

perspective that seems to surpass both the others. “The dimension of incongruity which I have been describing in this paper, appears to belong to yet another map of the cosmos. These traditions are more closely akin to the joke in that they neither deny nor flee from disjunction, but allow the incongruous elements to stand. They suggest that symbolism, truth, ritual, repetition, transcendence are all incapable of overcoming disjunction. They seek, rather, to play between the incongruities and to provide an occasion for thought” (1978c: 309). According to Smith none of the three maps can “be identified with any particular cultures at any particular time. They remain coeval possibilities which may be appropriated whenever and wherever they correspond to man’s experience of the world” (1978c: 309). See full discussion below “Map is Not Territory ...”

Catherine Malabou has proposed a new era of philosophy centered on the idea of plasticity.⁵¹⁷ In her 2010 book *Plasticity at the Dusk of Writing: Dialectic, Destruction, Deconstruction*, Malabou traces the history of the development of plasticity from Hegel through Heidegger finding that plasticity refers to “the inner mobility in the system” (Hegel) and “the very movement of being” (Heidegger). She posits a world without any exterior, outside; no transcendence. This shifts the emphasis to transformation and metamorphosis and away from trace and writing as championed by Derrida and others. While I am not adequately prepared to fully comprehend the impact on philosophy offered by Malabou, her use of neuroplasticity to distinguish her position from the writing-centered views of Derrida and others is, in the context of my present consideration, fairly clear. She writes, “The brain’s plasticity presents a model of organization that can still be described in terms of an imprint economy, but neuronal traces don’t proceed as do writing traces: *they do not leave a trace*; they occur as *changes in form*.”⁵¹⁸ She even concludes her book with an autobiographical note indicating her inspiration from the 2007 popular book *The Brain that Changes Itself: Stories of Personal Triumph from the Frontiers of Brain Science* by Norman Doidge. Malabou’s work deserves much fuller consideration that I believe might offer inspiration and precedent for vast changes in the academic study of religion.

My analysis of movement based on Barbaras and others perhaps differs from Malabou’s in that I do not believe movement is even conceivable much less physically possible without the presence of exterior, outside, environment. To me this is a most important difference. Movement in the sense of its moving (which is, I think what Malabou is focusing on) is “inner mobility” and “the very movement of being,” yet it is only movement in that it is the copresence of “here” and “there,” of “self” and “other.” Without this copresence there would not be the distance (even if virtual) that engenders the desire that is the “ing” of moving. This “moving” is not equivalent to trace or mark or retrograde or trace (all of those terms that Derrida and others have focused on in locating writing as core). Yet, I believe that, as I argued in Chapter One, there is also something of the trace and the grid and the retrograde in movement as well—“there’s movement and then there’s movement.” If we embrace, as Malabou suggests, that there is no trace, no exterior, no outside, no transcendence, then, as I understand it, there is no movement. Being would not be a vitality, but an unperceivable unexperientable proposition in an inert thing. I don’t see how her analysis of “ing” can become anything other than “thing.”

Furthermore, for the study of religion, to focus on plasticity and movement, is a fundamental way of providing access to that most distinctive characteristic of religion, its necessary inclusion of something “other.” I can’t see how we can get to any account of religion that doesn’t include in the most serious way this “other.” To ignore it reduced religion to the social or the cultural. To vaguify it, our most common strategy, with fuzzy terms like “other than human,” “supra-,” or “special” is

⁵¹⁷ Catherine Malabou, 2010 book *Plasticity at the Dusk of Writing: Dialectic, Destruction, Deconstruction*,

⁵¹⁸ Malabou, p. 79

to acknowledge the necessity but dodge the specificity. The specificity is why do we need some “presence of other” to consider something in the arena of “religion(s)”?

My sense is that it is in the careful consideration of movement (here I completely agree with Malabou) that we can begin to add “other” to our account of religion in a way that has clarity and specificity, but we can only accomplish this by the inclusion of the neurobiology of movement complementing the philosophy of movement. This strategy acknowledges that “otherness” is an aspect of “animateness,” and proposes that the human class of animate beings seems distinct among its brothers and sisters especially with respect to its capacity to hold as copresent moving both as “ing” and “thing.” Religion is an implication of this copresence. This chapter attempts to show that this human distinctiveness is inseparable from human neurobiology. This is not an argument to say that there is some spot in the human brain that enables this copresence. Quite the contrary, it argues that such copresence characterizes both the architecture as well as the coordination dynamics of the whole complex of neurobiological systems.

Certainly a “religious” or “theological” critique of my approach would perhaps be skeptical in its considering as necessary that “god” or any of the “specials” be the author of this distinctive neurobiology. From an academic study that focuses on an account of religion that would be significant to the study of religions, I’d suggest that the approach to giving some greater neurobiological/philosophical specificity to “other” and to “transcendence” provides a way of comprehending theological or philosophical positions that begin or end with interpreting the necessity of “other” or environment in the largest frames of cosmos or imagination, as Peirce explored so long ago in his provocative essay “A Neglected Argument for the Reality of God.”

The conjunction of the philosophy of movement with the neurobiology of movement promises the construction of a rich and profound basis for advancing the study of religion.

[Take on Keller as well, but then maybe I do that in “Future”]