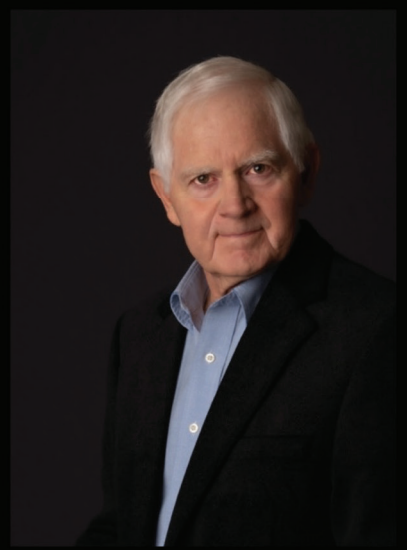
On Moving: A Biological & Philosophical Account of Human Distinctiveness

On Moving is a collection of thirty-one essays that explores human distinctiveness from biological and philosophical perspectives relying heavily on the author's decades of experience dancing, teaching dancing, and researching and teaching the dances of cultures around the world. Foregrounding the ongoingness of self-moving—examined in biological detail interwoven with body-oriented philosophy—the book avoids the thorny body mind problem and opens fresh perspectives with wide-ranging implications of practical as well as philosophical importance. The book originally published in an 8.5 by 11-inch landscape format with many photographs by the author is offered here as text only with some minor editing.



Sam Gill Professor Emeritus (PhD University of Chicago) University of Colorado Boulder, is author of many books and articles most recently *Religion and Technology into the Future* (2018), *Creative Encounters, Appreciating Difference* (2019), *The Proper Study of Religion: Building on Jonathan Z. Smith* (2020) winner of the American Academy of Religion's 2021 Award for Excellence in the Study of Religion in the category of Analytical-Descriptive Studies, *Dancing Graffiti: Stories from my Life* (2020), *Looking Forward in the Rearview Mirror: Travel Journal Selections with Reflection* (2021), and *On Photography* (2021).

Sam Gill

On Moving

On Moving

A Biological & Philosophical Account of Human Distinctiveness

Sam Gill

On Moving

A Biological & Philosophical Account of Human Distinctiveness

Sam Gill

Aesthetic of Impossibles ArtBook Series
No. 2 (rev. ed) - 2023

Aesthetic of Impossibles ArtBook Series

Exploring and celebrating being human is an abiding passion. I especially honor as a distinctive human gift our capacity to hold together without resolution things declaring them to be the same, even identical, while knowing they are not the same at all. A metaphor is to understand one thing by equating it with another that we know it is not. Art, ritual, language, maps, play, and masks all equate things we know are not the same. Impossibles! More than an interesting quirk, I find these impossibles a distinctively human and quite common source of power and value. Relying on its Greek root, "aesthetic" is not limited to concerns with beauty but rather suggests something more like "I feel, I sense, I perceive, I know." A bodied feeling kind of knowing. Linking aesthetic with the notion of impossibles opens for consideration, exploration, and sheer wonder this human capability to feel, sense, perceive, and know in ways that defy the banal terms of reason alone. Unlike other books in this series, this volume is not a text-photo hybrid, yet its design is shaped by a clear aesthetic.

sam.gill@colorado.edu
Sam-Gill.com
CV available

1. *On Photography,* 2021
2. *On Moving: A Biological & Philosophical Account of Human Distinctiveness*, 2022 (8.5x11 inch format with photos, 2022)
3. *On Skill & Mastery: A Philosophical, Biological, & Practical Account*, forthcoming

On Moving: A Biological & Philosophical Account of Human Distinctiveness

Printed in USA

Table of Contents

On Moving

It's a strange story. From math major to business graduate degree to career in business all given up to study religion at the University of Chicago while being neither religious nor especially interested in religions. Selecting the study of Native Americans for little reason other than as a farm kid from Kansan I felt I at least had a shared landscape. The map and the territory were familiar. Eventually amidst the desperation of mid-life crisis I turned to physical activity to repair decades of body neglect, a common side effect of academic lifestyle. It took years of effort accompanied by weakness, aches, and pains, yet moving my body was revitalizing and it soon became the most important thing in my life. I recall simply marveling at the feeling of walking. At age forty-five I stumbled into dance forms of fitness. Obsession soon followed. To bring coherence between the academic and moving parts of my life I shifted my academic focus to the study and teaching of the conjunction of dancing, religion, and culture. I also began to travel far and wide to learn and observe the dancings of many folks. Dancing is perhaps the least supported of all the arts in the West. It is rarely taught in school. Christianity is generally hostile to dancing yet social dancing is popular. It is often belittled by "real men." Despite all these discouraging forces, I began to realize that my passion for dancing was not some aberrant behavior of interest only to me. Across the world dancing is closely synonymous with cultural and religious identity. As I pursued the world history and the philosophy of dancing, I began to appreciate that dancing is an activity that powerfully exercises the highest of human

qualities and capabilities. I taught religion and dance courses at the university level for many years, including weekly studios I arranged for ninety students so they might experience dances of many cultures from around the world taught by dancers from those cultures. I founded and operated a school of world music and dancing teaching dance forms from many cultures. I sponsored cultural exchange visas for more than two dozen artists from around the world. Little did I realize at the time, what I was doing amounted to a social, ethnic, and arts experiment on a significant scale leading to broad diversification in the local communities and a whole generation of multiracial multiethnic kids including my three grandchildren one of whom is in L.A. beginning a career in commercial dancing.

In time I began to comprehend that while dancing holds a special and distinctive place among forms of human moving, the appreciation of all forms of moving has the potential to greatly deepen our understanding of what is distinctive about being human. I engaged fuller studies of the biology and physiology of moving. I am not trained in any way for these studies beyond perhaps my undergraduate physics minor. Yet to know something of this biology and physiology has seemed essential. We're talking bodies moving themselves in remarkable ways. Is it worth the risk that accompanies being a non-specialist to at least know generally how all this moving is biologically possible? While few philosophers have given much attention to moving, some offer remarkable insight. I'm no philosopher and for decades I thought philosophy elitist and often incomprehensible, yet the writings of quite a few philosophers have profoundly enriched how I fathom the wonders of dancing and self-moving. I discovered a powerful and important complementation among my studies of the biology and philosophy of moving, dancing, and fitness, my study of specific dancings in cultures and religions around the world, and my own years of experience constantly dancing and teaching dancing to thousands.

For a decade or so I was so immersed in my own dancing and later dance teaching, including both university courses in world dancing and my own physical dancing and teaching dancing to others, that I had little interest in academic writing. I felt strongly that the most important thing I could do was to dance and teach dancing and about dancing and to promote the teaching of dancing by artists from around the world. I somehow had faith, if I ever had time to think about it, that there would come a time to write about my experience and the growing knowledge I was gaining from traveling, dancing, teaching. In 2012 I published a book *Dancing Culture Religion* largely summarizing the core ideas I taught my university students. Subsequently I have published a few articles on dancing. I have developed a theory of religion and outlined methods for the study of religion centered in self-moving.

Now late in life, I continue to dance daily, and my passion has blossomed as I engage the work of articulating the insights I've gained on the broader topic self-moving as I have engaged it now for thirty-five years. Asking myself how best to express what I've gained and what I think there is yet to gain, the immediate answer has been "I want to write 'on moving'." Realizing that while *On Moving* is an appropriate title it is rather vague. Some might think it a guide to physically changing locations as in moving from Chicago to LA. Others might think of it as an exercise or fitness manual. Many are likely simply confused especially by the odd use of the "-ing" or gerund form of the word. We are much more accustomed to "movement." For clarity I have added the long and somewhat technical subtitle *A Biological & Philosophical Account of Human Distinctiveness* that accurately describes what I want this book to be.

Reflecting on this long period of having dancing and moving at the center of my life I realize that it has had the effect of utterly remaking me as a person. Beginning as a flabby out of shape academic with little body awareness, it is obvious that decades of extensive critically focused

dancing and physical activity would change my body shape and size, from the tone and strength of my neuromuscular system to the synaptic criteria of my brain. This change has not been superficial or cosmetic. It has been microscopic as well as global to me. Dancing and moving also have a profound impact I believe on the way one thinks and relates. It requires intense concentration to learn choreography and to gain the body awareness to move with grace and technical accuracy in rhythm. But it is a form of mental activity inseparable from the whole moving body, unlike intellectual mental activities that is usually done accompanied by a certain debodying. I understand now that this gesturally moving kind of intense learning was why I had little to no interest in writing, at least in an academic style, for so many years. I don't know whether anyone would recognize any difference in my writing, but now my writing is an activity that feels to me more like I feel when I'm dancing. There is a wholeness to the feeling, even though the techniques demand a certain debodying posture and stilling of moving. I have no idea how I would have felt had I not veered onto this dancing moving path, but I strongly believe it would have been profoundly different.

In recent years I have been fascinated by what to me is a core distinctive human capacity which is to hold together, often as equal, things that we know full well are not at all the same. I refer to this by the term "aesthetic of impossibles." Upon my first awareness of this remarkable capacity, I thought it likely occasional and marginal, yet I now find it pervasive, as inseparable from what makes us human beings. It defies linearity. It resists hierarchy. It demands relationality. It confounds reason. It demands and generates moving. It is ongoingness, process. It is this copresence of opposites, of impossibles, that generates energy and force and moving, indeed, vitality.

An aesthetic of impossibles is, in the context of reading and writing, that sense that we know the whole of the work copresent with the encounter of every word in the whole

work. Reading is, as is writing I think, recognition in a certain sense. We have a sense of what is to come, the whole, yet our anticipation draws us along word by word to confirm and reshape our foreknowing and our reading and writing includes even the hope and expectation of surprise. We read and write to confirm, "Oh yes, I know that. It makes sense. That's my world and experience." Yet we read and write in anticipation of those magical moments when a reader becomes newly aware, "I never knew that. I never thought of it that way!" Among my greatest pleasures in writing—I consider it alchemical—is that it just happens. As I ride along considering myself the writer-in-charge I discover myself as much the reader discovering myself and the world through the words that somehow appear.

The organization of the essays comprising *On Moving* have something of this aesthetics of impossibles character to them. Being collected under a common title they are all about the same thing. Yet I hope that the separate essays are akin to facets in a cut gemstone, each reflecting the same gem of a topic differently with the hope that collectively they will sparkle and fascinate. I have written them one after another in roughly the order they appear having in mind a certain unfolding or, perhaps better, a folding one on another like an origami figure, to reveal the whole. I have been aware in writing each succeeding essay of the ideas I have worked with in preceding essays. Yet, I've attempted to have something of a completeness (coherence?) to each essay, not overly relying on other materials for any single essay to be comprehensible. I suppose the essays then might be read in any order or by picking and choosing what topics, by title, seem of interest. While I love clever titles, I've settled on chapter titles that are simple descriptive that they might be most useful.

I've wanted to experiment with a post-academic style. I'm disenchanted by academic writing. The whole academic system needs a radical makeover. My desire is to write for anyone interested in pondering what it is to be human and

especially the relationship of being human to the ways we move. I'd love for at least some of what I write to have practical application which to me means it might help folks live healthier and more creatively. I'd be delighted if some of my writing is provocative, causing pause for reflection. I'd be overjoyed if some of my writing led to change in outlook and behavior. I fear I'd need a few more decades that I don't have to gain enough writing skill to be adequately poetic and artful to obtain my idea of a post-academic style and form. I realize that decades of academic writing including more than a dozen books and a great many more articles have shaped me in ways I'll never fully escape. I still think some aspects of academic thinking and writing are important and valuable (I still enjoy them), while many other aspects are deadly boring and utterly useless. Sorting it out takes time and the insights of moving. Yet, with pause and trepidation I identify this work as an ArtBook. In the first presentation of this book I exercised a certain audacity in arting up the book by choosing a different format—8.5"x11" landscape—and by adding some of my own photographs. I love photography, yet this activity too requires a skill that to claim even minimal mastery would take decades I don't have. There was temptation to make cliché photos related to moving and I'm sure I did not escape. What I imagined as wholly appropriate would be photos that capture the ideas I'd like to convey yet in a form completely different from writing, one more affective. I doubtless failed yet I still hope that my effort, a failure to be sure, might inspire others with greater skill and more creative imaginations. A PDF of the first format is available on my website.

Since that printing, I have decided that this new print only format might be useful and more accessible. I have also taken the opportunity to edit the text for accuracy and clarity.

1

Born Moving

Excitement with a tinge of fear keeps us on edge. The time has finally come. After months of anticipation, labor has advanced. Birth is near. Unspeakable pain with utter joy. Boy or girl? Healthy? It's here! It's a girl! She's moving! She's breathing. Relief. All jump for joy and shout "congratulations." A quick count of her fingers and toes in the timeless and quaint ritual measure of wholeness. Yep, all is well, moving, breathing, with ten fingers and toes.

Early human development is a miracle in motion. I've been fortunate enough to have three grandchildren whose early development I have been able to regularly observe. It is nothing short of unfathomable that in but two years' time, human life goes from a little fragile less-than-ten-pound bundle that mostly sucks and poops and cries and wiggles to a little character that can run and jump and speak and tell jokes and identify colors and engage in a huge range of social, intellectual, and physical skills. And even more remarkable is the hidden nine-month development from two joined cells to trillions of cells organized in a bunch of biological systems that work smoothly together to sustain life. This is biology, but not mere biology. It is a person, a living human being. I'm amazed that our culture seems so eager to dismiss and discount the body,[1] often with

[1] I'm writing shortly after SCOTUS decision on Dobbs (2022). I feel it essential to include a comment. As a student of religion, I have gradually over many decades come to foreground the biological commonality among human beings and all animate organisms. These complex systems are also echoed beyond biology. I've found myself moving to this biological and philosophical space largely as a strategy to consider

prejudice, preferring some vague constructs like mind or spirit or soul as offering a more adequate way of distinguishing who we are. The biology that transcends itself is more than good enough for me.

We are born into the world moving. From birth to death, moving is the go-to measure of the presence of life. A nonliving birth is referred to as a "stillbirth" and death is marked by the absence of breath, the rising and falling chest, and moving. As a fetus comes to life in the womb it is the mother's feeling it moving that assures her it is alive.

In her book *The Primacy of Movement* (1999 2nd ed 2011) philosopher Maxine Sheets-Johnstone[2] writes:

---

all life on some equal footing, the natural processes of biology and the reflective self-awareness needed for philosophy. While in this first paragraph I've focused on the amazing biological processes of a pre-natal being, it must be recognized that the development of this being is impossible without that of its mother and its father. One must also recognize that, as I'll consider repeatedly in these essays, human beings are distinct among their animal kin in their capacity to be self-reflective and to have agency beyond necessity. My studies of religion and culture and history, indeed the very existence of these realms of human life, attest to this capacity. It is of the distinctive nature of human beings to reflect on and to make choices about themselves and their communities and their environment. Human history might be written on the theme of how this remarkable human capacity for choice and agency is gained and lost, fought for, and denied. To be clear it is my conviction that prohibiting human beings from their freedom to make choices and have agency, especially as related to their private lives, and to insert the will of the state is, in the context of "the land of the free," blatantly un-American but even more so egregiously anti-human.

[2] Maxine Sheets-Johnstone's *Primacy of Movement* has had a powerful impact on my reflections on moving. While she does not emphasize the distinction between movement and moving—no one really does—that, as I'll show is important to me, she makes a powerful argument for the claim stated in the title of her long and rich book. What I have attempted to do in my ongoing studies of and writings on moving—shaped by Sheets-Johnstone, and by a few other philosophers, neuroscientists, and physiologists, as well as my own dancing and moving life—is to take this premise as radically as possible.

> In the beginning, we are simply infused with movement—not merely with a 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. (136)

We are not taught how to move. At birth we automatically grope about with arms and legs, suck, and cry. Throughout life many kinds of movings are acquired. Some of them are the natural and inevitable markers of human development: creeping, rolling, crawling, toddling, walking, running, throwing, playing. None of these movings need be taught to acquire. They accompany our species biology. Other kinds of moving are acquired or enhanced through instruction and practice. We learn—we are taught and critically guided through highly repetitive practice—sports and music and dancing and endless other activities, skills, and gestures based on the potential of the human body's design for moving.

Humans share with all animals the fundamental importance of moving. The word "animal" came to use in the early fourteenth century to indicate "any sentient living creature" including humans. Its Latin root *animale* means "living being, being which breathes" with historically deeper roots indicating "to breathe." From the 1540s the word narrowed a bit to indicate "pertaining to sensation" and a century later it was refined even more to distinguish the animal kingdom from vegetable and mineral kingdoms.

This narrowing of the term's meaning anticipated the development of the classification (taxonomic) system developed by the Swedish naturalist Carolus Linnaeus (1707-1778) that formalized kingdom, genus, and species. Generally, animals are sentient living beings that can move themselves. The distinctions among animal species often include attention to styles and modes of motility, how they move: swim; slither; crawl; having many, four, or two legs. Motility is acquired and refined differently among animals as well. Within minutes of birth, a foal manages to stand on wobbly legs and soon thereafter frolics about. Humans take months to stand on unsteady legs and take tentative and precarious steps. Yet we humans share the identity of life indicated by self-moving with all animals from amoebas to ants to aardvarks to apes to Adam. It is essential that we recognize our kinship with all animals.

Philosophers from Plato (427-347 BC) to René Descartes (1596-1650) to many in the present have emphasized that life is some sort of nonmaterial essence, perhaps eternal, referred to by various terms such as soul, spirit, ghost, even mind. Of course, this belief is a common indicator of religion. These cultural systems have tended to break apart the wholeness of animate life into such bifurcation as spirit/body, mind/body, self/body, oddly recently even brain/body. The result is often a relative diminishing of the bodied aspects of our existence. The body is often discounted as temporary, sinful, dirty, prone to illness and decay, and mortal. Gender distinctions often have unfortunate consequences when, as common in Western history, males are associated with mind and females with body. Yet males are the brute sex, females the fair. How odd! Such widely held and unquestioned views often encourage us to focus on fixing, controlling, flaunting, being embarrassed by, feeling overwhelmed by the simple fact that we are moving bodies. We often feel ourselves separate and distant from our bodies. We may try to ignore our bodies or control them. Yet, what is lost is the simple

wisdom we all know from experience—life and moving are more than just connected, they are identical. Philosophies (philosophy means "love of wisdom"), although concerned with truth, reality, knowledge, and experience, rarely focus on body beyond being a container or a vehicle or a tool, unfortunately ignoring the remarkable aspects of the vital creative capacity of bodies to move themselves. The primacy of moving is pretty much ignored. Religions, as I've studied them, often have irresolvable conflicting concerns with body. Moving bodies are at the core of ritual and essential to the stories of founders and prophets and leaders and martyrs and saints and saviors. Miracles are focused on bodied things. Yet soul, spirit, and the non-material essences tend to dominate, as also do mind and thought. Christianity, for example, centers on the Christ event, a bloody crucifixion and bodily resurrection. The central rites have to do with consuming the fleshy body and blood of the Christ. Yet throughout its history Christianity has expressed disdain, at best embarrassment, towards human bodies. Fascinating.

The German philosopher and mathematician, Edmund Husserl (1859-1938), was a founder of a highly influential philosophical movement called phenomenology that focuses on experience and consciousness. He used the term "animate organism" to indicate a complex yet whole organism, comprised of many systems and parts, that moves and in moving discerns itself and its environment. Even amoebas, as evidenced by their movings, distinguish among things they encounter in their environment. The notion of animals, including humans, as animate organisms, returns us to our simple folk wisdom experienced at childbirth and throughout life: we create and discover ourselves and our world through encounters experienced as we move ourselves about.

Our history and culture have encouraged us to think of ourselves as divided beings with our parts often in conflict. We feel our bodies and minds, our bodies and souls, get out

of whack with one another. Philosopher Maurice Merleau-Ponty (1908-1961) offered the conjoined terms "minded body" and "bodied mind." We strategize about how to balance or sync or unify or harmonize mind and body, body and spirit. Yet, like Humpty Dumpty of the classic nursery rhyme, after falling off the wall—a fall reminiscent of cultural and religious systems that focus on the Fall of Man, the inherently sinful body—"all the king's horses and all the king's men cannot put Humpty together again." We find ourselves in this never-ending struggle with the facts that we are already and always have been whole moving bodies and that there is a primacy to self-moving.

Without rejecting religious or cultural ideas and beliefs or philosophies, by trusting the obvious identity of life and moving we can focus on the whole-bodied, environment-connecting, self-engaging art and skill of moving. Humpty atop the wall before falling and breaking apart. The view is better. We can gain greater experience of health and wholeness and richness of life by realizing—experiencing and appreciating—that we are from our beginning whole complex bodies that in our moving about create and discover ourselves and the world in which we live.

What an emphasis on self-moving accomplishes is more than simply a wholeness preceding the Cartesian rupture or the Fall. It offers a different course that accompanies the dynamics of these distinctions once made. Moving, as I'll show, while thoroughly corporeal (of the body) is also transcendent and incorporeal (virtual, nonmaterial). The nature of moving is that it always impossibly conjoins here and there but never being in either place. Moving is fully body, physiological and biological, yet also entwined with environment. The dynamics of these and other impossibles is the very force of life. Self-moving is at once wholly body and yet transcendent. It is in light of this *aesthetic of impossibles* that I'll explore moving.

2

Life-Stage Movings

Life is a cycle or a journey, as we so often say. Metaphors by which we grasp and express the ongoingness of life. Life moves. We experience it as flowing. We can't get it to stand still even for a moment so that we might come to terms with it. Life seems to be going somewhere. We are born moving—groping and breathing—and no matter how still we sit, how quiet we are, how controlled our breathing, life is unceasing motion. Of course, given the alternative we are happy about this flow, yet we sometimes feel frustrated that we can't seem to get hold of, grasp, our own lives and, indeed, life itself. What's it all about? we wonder. Any answers seem tentative; in the next moment anything might happen; our lives may veer off or turnabout or end.

The common life-is-moving metaphor informs much of our language. We are born *into* the world and life, we *travel* on a life *path*, then we *pass away* or *pass on* at the end. These metaphors suggest we are visitors or travelers coming from and returning to another place. Yet where? We *turn* various ages. Stages and periods of life seem a bit more concrete only once they have passed when we might look back, often with nostalgia, to when we were kids or teens or in college or first married. Even then our memories shift and fade. When we are young, we want to rush to get older. When we are old, we feel life is careening towards death.

For a while I was inclined towards the phrase "moving through life," but it misses what is important. Life is not some medium, like the sea or molasses, through which we move. Life is the moving itself that takes on various styles, patterns, and features that correlate with life's stages.

Life-stage movings correlate loosely with objective calendar time, that is, regular numbered units, as we identify with a specific numerical age. Yet our experience of time is anything but regular or objective in part because our own body movings vary. We use the same terms for both. As we experience it, life like time flies, rushes, drags, runs, crawls, saunters, creeps. The cycle metaphor—time cycle, life cycle, the circle of life—is based on the cyclic repeating patterns that surround us, heartbeat, breath, and the larger cycles of wake/sleep, day/night, seasons, lives. And as we experience generation following generation, we project on life a cyclic pattern. We mark seasons in the life cycle, correlating with vegetation and yearly seasons. Thus, to imagine the whole of life as a cycle may be a protective hedge against the relentlessness of time, against the ominous *memento mori*, the ubiquitous reminders of the inevitability of death. Animate life correlates with plant life in this respect. Indeed, the recognition of how death defeats death is grounded (as in soil) in the life and death cycles of plants. This aesthetic of impossibles is not uncommon to religions where death may be the birth of a new life or where death is deemed life eternal. The basic observation is that we live and experience a tight nexus among life, time, and moving.

There are two common ways of accounting for the development of animate organisms across time. One is phylogenesis, the other ontogenesis. Phylogenesis—from the Greek *phlon* meaning "tribe, clan, race" and *genetikós* meaning "origin, source, birth"—is concerned with the evolution of species over long periods of time. Ontogenesis—from Greek *ontos*, meaning "being"—is concerned with the development of an organism within its own lifetime. Notably, for various animate organisms there are correlations between phylogeny and ontogeny, between the stages and processes of the evolution of the species with developmental stages within the lifetime of an individual in the species.

I'll return later to consider more fully human phylogenesis in terms of moving, but it is important to recall those common graphic images that depict the "evolution of man [sic]" showing on the left an apelike creature barely arisen from four legs and on the right the upright bipedal walking posture of modern humans, though usually depicted as male. The several species/figures between the two extremes are shown to gradually *rise* from just post-quadruped to biped with knuckle-dragging front arms to full uprightness. Foreshadowing later consideration, I suggest that our concepts of progress and advancement and value are based on this corporeal (body) experience linked fundamentally to motility, modes of moving. Development of human individuals (ontogeny), at least in the early years of life, replicate development of species (phylogeny) in terms of motility. At birth humans are mostly supine. We then can roll over to prone followed by the gradual process of crawling, sitting, standing, bipedal walking replicating during the first year or two of life the whole process thousands of generations long of species evolution.

The various stages of life correlate with patterns and amount of moving. I like to think of the earliest stages of moving being characterized by innate curiosity and interest in encounter with our own bodies as well as what is beyond them. Lying supine infants actively move their arms and legs and heads in groping patterns. They respond on contact with anything. Within hours of birth infants can imitate large facial expressions; this is called oddly "invisible imitation." Their fingers grasp objects encountered. The suck anything their lips touch. It is notable that moving and touching are often ignored or rated lower than the other senses, especially sight, even though they are the most active immediately at birth. And as Helen Keller (1880-1968) held, they are the most indispensable of senses. Importantly touching and moving have a close, nearly inseparable, relationship.

We often feel it takes such a long time for an infant to develop into the fully human bipedal walker. Yet, once walking begins, running soon follows. I am forever amazed that for a few years young kids walk far less than they run. Even crossing a room often calls for running. Adults so often hear themselves yelling at these kids to stop running. They seem unaware that in but a few years they will be begging the same kids, now teenagers, to get out of bed or off the couch. From the perspective of a late stage in life, I am utterly envious of the natural energy of kids. It is well known that this early stage in life, the running/playing stage, is the most important in the development of language, sociability, sense of self, personality, intellectual ability, curiosity, whole body health. It is a time of life we might describe as exuberance. It is essential to acknowledge that this period is the time when human beings are the most physically active, when we move the most in our entire lives. It is a time of playing and playing is allied with running and active moving. It is impossible to deny the importance of active moving to the development of the most important foundations of human health, well-being, and the individual's potential.

Given the essential importance to human development of moving and playing and touching, it is odd that modern Western society (and across the world, due to Western influence) is eager to get kids in school at the earliest possible age. There is no denying that early schooling of kids is essential to high achievement in school and career in the terms established by our society. Yet the restrictions on moving/playing—we call this forced constraint socialization and developing discipline—that often come with school, at least the traditional notion of school, give pause for reflection. Schools, as institutions and as architectural spaces, are designed to regulate and often restrict moving. School typically takes place in square rooms with students sitting at movement restricting tables and desks. Time and activity are regulated. Whereas the foundations of life are

acquired by running and playing and physically interacting, in school we frequently tell the kids to "sit down, be quiet, keep your hands to yourself, so you can learn." Running and playing are excluded from classrooms being shifted to playgrounds and recess and afterschool activities. Remarkably the word "recess," whose use arose in the sixteenth century, comes from Latin *recessus*, from *recedere* "go back." The root correlates with the use of the term to indicate something set back in a surface such as recessed lights in a ceiling. The use of the term to reference an outdoor respite from classroom activities perhaps suggests going back to the running/playing stage of learning engaged prior to starting school. In school, moving and playing become ways of releasing energy, of letting off steam as with a pressure cooker. This attitude implies an unfortunate negative valuation of the natural energetics of moving in relation to learning. Touch is closely related to moving. While children must be protected from inappropriate touching, the enforced forbidding of touch has sad consequences. In her 1990 book *Natural History of the Senses*, Diane Ackerman noted that "touch seems to be as essential as sunlight." Studies show that infants in orphanages who are never touched do not properly develop, some even die. As school progresses through the years, kids who enter so eager to learn, often become bored and frustrated. Is it possible that the powerful connection of living and moving and touching and playing is essential to engaged excited self-motivated learning? Much to consider.

Through life there seems, at least in the normal course of modern Western life, a continual diminishing of moving, both the amount of time we actively move and the liveliness of our movings. By middle and high school, moving is shunted to sports and afterschool activities. Active movers—athletes, dancers, cheerleaders—are often considered dumb (should I say intellectually challenged?) or poor learners. Even in-school offerings of physical education classes have diminished. For years I taught dance in a

progressive high school, yet it was an elective. The late Sir Ken Robinson (1950-2020), British education advisor, noted sadly that "there isn't an education system on the planet that teaches dance every day to children the way we teach them mathematics. Why?"

By the time we begin a career, a huge portion of the work force is stationed at desks in cubicles or remotely in home offices hunched over computer screens. Moving is mostly passive, as in a vehicle, restricted to commuting to and from work or shopping. Standing and moving are often now engaged only when prompted to do so by an app on a smart watch. Active moving is commonly shunted to the weekend periods of recreation or to the after-work visits to the gym or fitness center done largely to maintain physical health and control weight. There has been a seismic shift in the extent of moving associated with occupation over the last century. Much to be concerned about.

A few years ago, I was in a public bus—I think it was in New Zealand—when I noticed a sign depicting a silhouette person standing with hunched back and kyphosis (head hanging forward) using a cane. The sign designated that passengers should yield seats to old people. I was struck that the public stereotype of the aged depicts a person with bad posture and restricted or challenged mobility. I began to wonder if these physical conditions are based in some biological laws of aging or if they might be the result, at least in part, of societal and cultural expectations. I have seen in other countries—I'm thinking of Africa and Asia—elderly women carry everything, heavy loads or even their purses, on their heads. Upright posture is essential. It seems that, without denying the biology of aging, maintaining an active moving life, which is accompanied by healthy posture, contributes to longevity, and, as importantly, to a pain free vigorous energetic life.

There is much to recommend that active, energetic, and regular moving as essential to healthy and long life.

3

Moving is Being in No Place

If we pay attention to our feelings, we often encounter things that surprise us. Too often we dismiss the potential of being surprised. Surprise is a feeling kind of knowing that underlies our creative and innovative lives. The American philosopher, Charles Sanders Peirce (1839-1914), was, throughout his life, deeply interested in how we discover new things, how we come up with something new. His philosophy has much informed my view of creativity and novelty.[3] In technical terms, how do we give birth to hypotheses? He gave much attention to the felt experience of surprise and to the processes he eventually identified as play. Surprise is the felt reaction to the awareness of incongruity, incoherence, the absence of fit. Surprise is not the logical consequence of a studied reasoned process. It does not occur as the result of our attempt to feel it; such would ruin the surprise. It is largely subjective and individual. What surprises one may not surprise another. Surprise is a feeling that may foreshadow the need for reason and further consideration. Surprise nudges us to concoct a possible explanation whose acceptance or confirmation would resolve the driving force of surprise. Surprise inspires the "what if" iterative process that produces many possibilities in search of a resolution. In more formal language and in more formal settings surprise inspires hypothetic inference, that is, the imaginative playing with options to find the best guess as to why

[3] See "To Risk Meaning Nothing: Charles Sanders Peirce and the Logic of Discovery" in *Creative Encounters, Appreciating Difference.*

something surprises by not making sense or even by making sense in an unexpected and unanticipated way. The best guess, formally stated, becomes a hypothesis to test. Much of the scientific method is focused on induction and deduction, both demanding facts and reason to test hypotheses, but these two methods do not include the process by which hypotheses come about. Peirce used the term "abduction," which means moving away from the center as well as to carry off by force, as synonymous with the creative process of hypothetic inference. Abduction is followed by induction and deduction.

There are key insights related to surprise as the basis for knowing and creativity. Incongruity, which we often find painful or uncomfortable or a persistent niggling, is essential to creativity and innovation. Popular psychology urges us to find balance, or coherence, or meaning. Yet, it often does not recognize that it is the incongruity that surprises that leads to thinking, reflecting, acting, all essential to creativity and the advancement of knowledge. French philosopher Paul Ricoeur (1913-2005) observed "Incongruity gives rise to thought." We often ignore the surprise of the incongruous, the incoherent, the nonlinear, yet embracing surprise may open the door to discovery and growth. While we often restrict knowing and learning to purely mental and abstract processes, the foundation for real and significant discovery and new knowledge is based on feelings—hunches and guesses and especially the feeling of surprise—and feelings are inseparable from the subjective self-moving body that comprises the history of individuals.

This brief discussion of surprise and discovery provides context for one of my own stories of discovery. Some years ago, I experienced surprise that gave rise to a long history of inquiry. Reading Brian Massumi's 2002 book *Parables for the Virtual*, I came across his brief phrase "moving is being in no place." Wait! How can this be? Hmmm. But then, come to think of it, this is obvious! To

put moving in place is to deny it its most essential quality of ongoingness, the -ing of moving. Why am I surprised? Hmmm. Because, it slowly dawned on me, we usually don't think of *moving*, we think of *movement*. And historically, culturally, this vocabulary choice privileges being *in place*. Movement is preferred in our language and thus our thinking. It means a change in place or position. What is the significance of this difference? Who cares? Is this not just a matter of word choice and has little to do with anything important? My own bodied experience regarding moving, as I reflect on it, is not that of merely a change of position, even if my language favors it. My experience is of flow, of process, of … wait … oh yes, of life itself. That's significant and important, right?

Moving is being in no place. It is ongoingness. Yet, in all this seeming abstractness and virtuality, it necessarily implicates relative location from and to, here and there, a vectored or direction-oriented going. As Erin Manning wrote, moving is "qualitative multiplicity . . . becoming toward a potential future that will always remain not-yet." Moving may be the most primal aesthetic of impossibles. In common sense, moving implicates something that is ongoing against a ground or ether. This use of the term "ether" refers to a medium that in the wave theory of light was once thought to permeate all space so as to give ground to the transmission of light waves. For millennia, the stars were thought to be features on a fixed dome of the heavens. With the knowledge that light is composed of waves, it was believed that these waves needed some grounding medium or matrix to allow them to travel across space, something like water or air, some fixed fabric to all of space. Yet the 1887 Michelson–Morley experiment designed to confirm the existence of this ether failed. The surprise of this failure, this unexplained incongruity, led to relativity theory in modern physics. We might think of relativity theory in physics as equivalent to the philosophical statement "moving is being in no place." While the ongoingness of all

moving bodies is detectable, it is so only relative to other ongoing moving bodies. There is no fixed and unmoving ground. Movement, that is, change of place, is always trumped by moving, since place itself, no matter how seemingly fixed, is also always moving. While this example is seemingly so cosmic, so mathematical, so abstract, so philosophical, it coincides with the persistent relativity of our common experience of life.

The Greek engineer Archimedes (287-212 BCE) is said to have proclaimed "give me a place to stand on and I can move the world."[4] While the context of this statement was believed to have been about the nature of levers, it has commonly been interpreted, consistent with the common preference for movement rather than moving, as attesting to the importance of place. Archimedes' adage is often cited to beseech one to find or proclaim place on which to "take a stand." Yet we might also interpret Archimedes' wisdom in terms of the agentive focus, that is, to move the world. Surely, he was primarily interested in moving the world rather than in any location of or change of place.

Our existence, our life, as human beings is inseparable from self-moving, from the physiological miracle of being an organism that is biologically capable of moving itself, but also of having amazingly sophisticated sensory systems that allow us to be aware of this ongoingness, this moving, this being in no place. It is an awareness, a cognizance, of an abstractness of moving that transcends its biology, its mere physicality. We sense an incorporeality, that is a nonmatteriality or virtuality, coexisting with the brute corporeality of moving. Moving is at once fully body, engaging the full

[4] My mentor, the late Jonathan Z. Smith (1937-2017), often quoted Archimedes to communicate his sense of the importance of scholars being relentlessly self-reflective, by which he understood their selection of a place to stand on, holding that a theory or body of precedent pretty much determines the outcomes of the resulting academic studies. I have reflected extensively on Smith's influence on my academic life in *The Proper Study of Religion: Building on Jonathan Z. Smith* (2021).

capabilities of physical body, and moving is also transcendent and virtual, the denial of place and any fixedness because the essence of movings is ongoingness. This felt knowing experience of the copresence of the material and the transcendent, of the body and its life force, gives a powerful foundation to our species designation as Knowing Humans (*Homo sapiens*). Our very knowing is at once necessarily bodied, corporeal, as well as transcendent, virtual, a force, ongoing moving, process, life. Copresent impossibles.

To experience ourselves as the impossible conjunction, *incorporeal corporeality*, that is the experience of being a moving body, is to tap the core of the evolved capacities that distinguish us, among other animals, as our own species. Other animals do not reflect on or contemplate the nature of their own moving lives. This moving-based experience of and conscious awareness and experience of this copresence that I call an *aesthetic of impossibles* is what distinguishes humans. I believe that it is this common human experience that leads to so many human actions and behaviors that depend on the embrace of impossibles that coexist by necessity: religion, art, language, play.

4

Movement, Moving, Self-Moving

Living movement … constitutes
the unity of the living being.
Renaud Barbaras, "Life, Movement, Desire"

A bunch of newborn kittens was divided into two groups all kept in the dark. When they were brought into the light for periods of time, one group of kitties was free to move about save for being attached to little carts. Each of the kitties in the other group was placed in a cart. Thus, one group were active movers using their muscles, bones, nervous system, vestibular system. The other group moved roughly through the same space, yet they were passive movers. Newborn kittens take a while after birth to develop sight. In this experiment the active moving kittens developed normal sight while the passive movers did not. Even after the critical period in which sight normally develops when the passive kittens were allowed to be active movers, they did not gain sight.

This is a disturbing story given the sad blind kitties. The Brandeis University scientists, Richard Held and Alan Hind, who did the kitten experiment in the early 1960s, were interested in the development of visual perception related to active and passive movement.[5] I offer this story to explain and emphasize the importance of my persistent

[5]Held, R. and Hein A. (1963). "Movement-produced Stimulation in the Development of Visually Guided Behavior." *Journal of Comparative and Physiological Psychology* 56(5): 872-876. http://embodiedknowledge.blogspot.com/2011/12/classic-experiment-by-held-and-hein.html

use of terms that may at first feel jarring, inelegant. The terms are "moving," "movings," and "self-moving." I'll explain further, but I feel, as powerfully illustrated in the kitten example, despite the minor distinction made by using the gerund or -ing forms of these terms to make them active, the distinction must be taken as seriously as possible. Naturalizing the common use of new terms related to moving requires vigilance and discipline. There is a fundamental difference for animate organisms between passive and active moving, between changes in location and biologically effecting and experiencing change ongoing.

Haggling over words, what they mean, how they are used, their history, what implications accompany them may seem tedious, picky, and unnecessary. As a lifelong academic I'm increasingly impatient with jargon and the so-called merely academic. My concern may appear downright overkill in the contemporary world of communication where public discourse is so often crude and banal and where increasingly a few letters in a text or tweet or an emoji or a sticker or a TikTok vid comprise the bulk of our discourse and where thought-demanding reading and the precise use of rich vocabulary are in sharp decline. I am also aware that changing our use of deeply naturalized language even in minor ways, especially broadly in culture, is near impossible. Feminists in the 1960s insisted on gender-inclusive pronouns and, while now over half a century later most folks are at least aware of the importance of gender inclusiveness, the default to male gendered words is far from gone. Our language impacts how we understand moving and how we practice moving in our lives. Our regular repeated use of common terms—I'm thinking mind and body, spirit and body, even movement—are so gesturally naturalized we consider them to be unquestionably just-so despite them having what I think are unwanted implications. It takes a long time and much repetition to supplant these terms with new ones that are more interesting, accurate, and useful.

There is a small group of words that we regularly use related to a general class commonly referred to as movement. These include nouns and verbs and adjectives. The term "movement," a noun dating from the fourteenth century, indicates a "change of position: passage from place to place." The older Proto-Indo-European root *meue-* that indicates "to push away" is mostly gone from current use that favors object and location. Dating from 1828, the noun is also commonly used to refer to acts and endeavors of groups who share a specific end, such as political, social, or religious movements. These ongoing groups often identify themselves by the principled goal (place or ideal) toward which the group moves. The remarkable implication I'm most concerned with here is that using the word "movement," with its emphasis on place, tends to halt the most distinctive characteristic of that to which we refer, its moving, its ongoingness, its process. It ignores that feeling knowing of moving being in no place.

Western cultures and languages tend to prefer nouns. This is not true of all languages. Navajo language, which I once studied, is extensively weighted towards verbs. In Navajo experience everything is ceaselessly ongoing. While Navajos have trouble stopping the moving to form nouns, we prefer nouns. Even the way we articulate a noun is often to identify its place. We are irritated by things or people not knowing or staying in their place. We seek stability such as centers and balance. Moving is often grounded, located, held firm, by identifying centers or axes, turning moving into movement. Maps both locate places and offer means of accounting for history by charting the change in position of boundaries and people across boundaries. Borderlands attract attention in that they locate the threat of ambiguity, trespass, foreigners. It is at borders where people change position, locations, places. Immigration is often associated with folks who won't or can't stay in their place, who want to be in the place of others. People whose identities don't fit so-called traditional categories, LGBTQ folks and even

folks of different colors, are often felt to be threatening. This fear may be cruelly expressed, "if you don't like it here go back to where you came from." Androgyny and ambiguity, even inclusive pronouns, are felt by many to be uncomfortable. Some groups actively oppress others for fear of being replaced. Maps are used to give place to itinerary, being in specific places at specific times. The natural sciences use grids and charts and numbers and graphs to locate objects and their patterned behavior in terms of the character of the way they change positions. Natural laws are commonly framed as the regular and lawful way physical objects change positions. Medical science tends toward specialization based on specific organs or parts or systems.[6] My former mentor, Mircea Eliade (1907-1986), was well known for holding that regarding understanding another's religion the question of the character of the place on which one stands is the fundamental question. Attitudes and feelings toward place, being in place, and the valuation of challenge to place reveal much about any culture or people or individual.

The verb "move," that has similar meaning when used as a noun, appeared in English in the late thirteenth century from Anglo-French *mover*, Old French *movoir* "to move, get moving, set out; set in motion; introduce." It, like movement, was used in the physical sense, to indicate "change one's place or posture, stir, shift; move the body; move from one's place, change position; to go (from one place to another), journey, travel; set out, proceed." And in a nonmaterial emotional figurative sense its early use was to "excite to action; influence; induce; incite; arouse; awaken."

---

[6] Carrie Noland, *Agency & Embodiment*, replaces the word "movement" with the term "gesture" for her insightful analysis of kinesthesia, the feeling sense of moving. She does not make the movement/self-moving distinction I make here. I will take up the term gesture in a later essay. In building the various nuances of self-moving, I have selected a different set of terms because I believe that they build on one another more clearly.

By the fourteenth century it indicated to "affect (someone) emotionally, rouse to pity or tenderness." In the late fifteenth century, it included a "change in the position of a piece in the course of play" as in checkers or chess or Candyland. By the early seventeenth century it referred to a change in one's place of residence. There are, of course, many nuances to the term, yet emphasis, whether used as verb or noun, is on change of position, referring to object and place. The issue remains that our terms freeze and halt the actual moving.

Now "moving." Not to be a grammar wonk but adding -ing to a verb in English is the way we form continuous tenses like sitting, running, thinking. Ah, you see my madness. The present participle puts at least some of the moving, the ongoingness, back in movement. The word "moving," a present participle constructed by adding -ing to the verb move, came into use in the 1590s indicating something "that touches the feelings" and 1650s as "that causes motion." It is fascinating that these word roots connect the emotional feeling component with the ongoingness of moving. This connection bears further reflection. Occasionally scholars will use the phrase "movement *tout court*" in the attempt to indicate "simply" or "just" movement suggesting the moving itself rather than the places, yet few of us readily feel comfortable with the added French. Given the history of persistently defaulting to change of place and to object, philosophers engage fascinating, if also complex, language to attempt to reference moving in its ongoingness. For example, in his *Parables for the Virtual*, Brian Massumi wrote, "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" (4-5, italics

in original). Notice he still relies on the noun forms rather than moving. Yet, Massumi adumbrates the aesthetic of impossibles—real but abstract, corporeal but incorporeal, of body but not body—that I wish to develop as fundamental to the ongoingness I intend by my use of the term "moving." By using the odd plural "movings," I make the action and ongoingness of moving into a plural noun—this all seems so complicated suddenly—to suggest that there are many ways we perform and experience moving: walking, shaking, running, dancing, playing. The benefit of this odd plural is that the ongoingness of moving, while virtual, none the less is widely varying, can occur in many ways. Moving, while of the body, is virtual. Moving is a transcendent aspect of the living body. Moving is "to other" the body—that is, to experience it as more than simply matter—as it most fully realizes the body—to experience it as alive and vital in all its biological materiality.

From antiquity we have one of the most provocative demonstrations of the distinction between movement—change of place—and moving as ongoingness in the famed so-called Arrow Paradox offered by the Greek philosopher Zeno (c. 490-430 B.C.). As stated by Aristotle, or so it is supposed, "If everything when it occupies an equal space is at rest at that instant of time, and if that which is in locomotion is always occupying such a space at any moment, the flying arrow is therefore motionless at that instant of time and at the next instant of time but if both instants of time are taken as the same instant or continuous instant of time then it is in motion." Or to put it slightly differently and hopefully more simply, if an arrow is shot toward a target, it must first cross half the distance. Since and distance can be divided in half an infinite number of times, the arrow can never reach the target. This is not a paradox, it is a demonstration of the confusion that arises when the halting, gridifying, post-moving analysis replaces the ongoingness of moving, which, as I discussed in the preceding essay, is essentially being in no place. Zeno, as

Aristotle understood him, focused on movement understood as "that which is in locomotion always occupying such a space at any moment," rather than the moving itself, or that which is never in any place by its very definition, otherwise it would not be moving. Zeno's problem is understood by appreciating the ontological difference between movement and moving.

Finally, returning to those sad kittens, I come to the term "self-moving" to denote biologically active moving. Interestingly the term "self-producing movement" was used by the scientists who did the kitten experiment. Passive moving is very different than active moving. Only the latter involves the entire functioning biological organism often with intention. Most of the following essays will explore the important implications of emphasizing self-moving. I believe that, especially given the formative power and influence of our common language on our lives, words matter. By focusing on the common vocabulary of movement, the roots and history of usage of the terms, we can appreciate the full weight of the long history of our culture and our language to emphasize object and place over process and action. By using the terms *moving*, *movings*, and *self-moving* we remind ourselves that, above all, we must carefully reflect on and attend to the active, often intentional, fully organically biologically engaging process of the ongoingness of our moving because it is precisely in this aspect of moving that we create and discover our world and ourselves.

5

Moving Bodies

"When I think of my body and ask what it does to earn the name, two things stand out. It *moves*. It *feels*. In fact, it does both at the same time. It moves as it feels, and it feels itself moving." These are the first sentences in Brian Massumi's provocative 2002 book *Parables for the Virtual: Movement, Affect, Sensation*. These statements, if you think about them, are prosaic. They state what each of us experiences all the time. Massumi reveals nothing we cannot confirm upon reflection. None the less I've returned to these sentences many times because I find they express in bold simple terms profound wisdom about human self-moving.

I'm stirred by the wonder of our moving bodies. How is it that bodies move? Move themselves? How can the moving that the body is and does be initiated? Doesn't something need to be already moving for moving to occur? Does something give it a shove? How is it possible that we feel our bodies moving? To feel ourselves moving is outside the purview of the common five senses. Yet it is this feeling of ourselves moving that is at the core of our experience as well as our sense of truth. When we take even cursory note of the feelings related to our moving, we discover that they are remarkably complex. It is common to feel moving in specific localities, a finger or even a muscle. Put your hand behind your back and move just your first finger. So easy, we not only can control the specific movement, but we can also mentally see and feel it moving. How is this moving/seeing/feeling possible? What do I do to get my finger to move? And then, when I can't see it, how do I know it is moving? I somehow feel it moving. These capacities to feel,

to move, to feel moving simply astound me. We also have a general awareness that we, our whole being, our whole organism, is moving, both all the time and, in the moment, in specific ways like playing, running, dancing. If we are a skilled mover, we also feel the quality of our specific movings. We feel our location as bodies moving in the world. And we feel the trajectories and destinations—our finger scratching our ear, our performing a back flip, our playing a melody on a guitar—of our many body parts even when we cannot see them. We feel the difference between our two hands touching, even the difference of one of them touching the other (the touching hand and the touched hand), yet we also feel both hands to be me, my hands. I can use my shoulder as a tool to bang open a door thinking of my shoulder as a thing, a ram, a tool, yet it is still me, of my whole moving being. It is at once an object I use, and the subject I am. How can I think of my moving self as both subject and object at the same time? Clearly distinct, yet identical. Moving and touching—which we often call feeling—seem intwined, yet also distinct. We notice that these feelings of moving are not limited to sensory place locators, we also feel an array of qualities to be stitched to our movings. We often refer to these feelings as moods and emotions. Isn't it fitting that the word "motion" is embedded in emotion, yet might we be more accurate to call them e-movings? Maybe too far! The terms by which we describe some emotions—pleasure, joy, depression, anger, rage, elation—correlate closely with qualities of moving related feelings. Technical aspects of moving are felt as tension and resistance, smoothness and jerkiness, coherence and incoherence. We commonly experience pleasure or discomfort, sometimes pain, in our moving. The quality of feeling related to our moving is a measure of our health, age, fitness, emotion. There is delight in moving, ask any four-year-old—they run everywhere no matter the distance—or a dancer or an athlete. They also experience the feeling of grace in moving. Can we comprehend such an important

quality as grace without it being a characterization of the feeling of moving bodies?

There are biological and philosophical ways of understanding and appreciating how the human body moves and feels as it is moving. Both inform the practical concerns of developing healthy moving bodies. Biologically we need to consider *proprioception* (self-perception) which is a complex system spread throughout the body, especially in the muscles and joints, that directly senses the actual moving in progress and adjusts in an ongoing process to refine the moving. A property associated with proprioception is *kinesthesia,* the mechanism by which we feel ourselves moving, both to locate the moving body parts as well as the quality of the moving. Moving is foundational to all perception, as suggested in the kitten experiment. Moving is linked with how we experience and reckon time. Moving is important in our perception of depth. Neuroscientists often describe the brain and nervous system as designed to facilitate the moving body. Proprioception and kinesthesia have termini in the cord and brain as well as in muscles and ligaments. The shaping of synaptic criteria serves the formation of neuronal groupings—memories, motor programs or synergies—that allow the performance of complex and refined tasks such as skills and gestures. Philosophically, moving is associated with developing a sense of self as well as the surrounding world in which we live and move. Moving is the foundation for concept formation. It is essential to even such seemingly abstract notions as transcendence and those of pure mathematics. Moving body is key to what we refer to as body image, how we think others see us, and body schema, our objective moving biological body. All these aspects of moving help us not only appreciate that our moving bodies are how we create and discover ourselves and the world, but they are also essential to our efforts to understand healthy moving and to create practical ongoing skills of moving that contribute to a healthy life. Even our understanding of

health is assessed and articulated in terms related to self-moving.

One fundamental concern I have, a bit of a pet peeve, has to do with the common word "embody" and its forms and synonyms. The verb embody means "to be an expression of or give a tangible or visible form to such things as an idea, quality, or feeling." We say things like "that team *embodies* competitive spirit and skill" or "George Washington *embodied* so many of the virtues that Americans hold dear." While there are many appropriate uses of the embody terms,[7] there are some uses that refer to the human or animal body about which I suggest caution. The prefix *em-* modifies word-meaning to indicate "put in or into, bring to a certain state." Statements like "we humans are embodied" or phrases that designate embodiment like "I have a strange relationship with my body" or "I don't feel comfortable in my body" have implications I believe we should be aware of and cautious about. These embodiment statements denote a distinction indicating that identity is some non-

[7] As evident in her title, *Agency & Embodiment: Performing Gestures/Producing Culture* (2009), Carrie Noland retains the use of the term embodiment which she describes as "the process whereby collective behaviors and beliefs, acquired through acculturation, are rendered individual and 'lived' at the level of the body" (9). She depends primarily on the work of the anthropologist, Thomas J. Csordas, who has argued in several publications for embodiment as a paradigm for anthropology. My distinction, picky and technical as it might be considered, is that I simply don't see an alternative to behaviors and beliefs being even possible apart from body. The best one could argue, given Noland's definition, is that they exist somehow abstractly as "collective behaviors and beliefs" yet surely anything called behavior is incomprehensible apart from moving body. While it is certainly legitimate to use a term like collective behavior, it can be given no substance apart from an abstraction based on a collection of individuals. Behavior is always body. Body is always individual yet existing in the environment including other social and cultural bodies and the entire world. The danger in using the term embody is that on the one hand it defies the primacy of self-moving by making it somehow the result of the collective and on the other hand it foregrounds the tendency of Cartesian views to see the body as but a container or vehicle.

material essence, spirit, soul, or ghost that merely lives in a body, perhaps on a temporary basis like a renter. Granted that many religions, some philosophies, and lots of folk hold such ideas, there are benefits to avoiding the assumptions of this separation. This separation of self from body dates from antiquity yet the strongest influence that shaped the modern near ubiquitous assumption of this separation is René Descartes (1596-1650) whose "I think, therefore I am" (*cogito ergo sum*) on the face of it places primacy with thinking, with mind, leaving the body with but a vehicular role, as regrettably necessary. Yet, apart from religious usages which require their own consideration, the idea that we move in and out of a body suggests pathology, a broken Humpty Dumpty that must be put back together, if only we could, even with the aid of all the king's horses. I am skeptical regarding the vogue for assuming that we are all (by nature? by original sin?) broken and ill and need to be healed, centered, balanced, reunited with ourselves. Animate organisms, to use Edmund Husserl's term, including human beings, are moving bodies, whole and complete, with wondrous near-unfathomable capabilities and potentialities. While in some contexts it may be suitable to imagine ourselves apart from our moving bodies, I believe we must avoid the assumption that our makeup is a disjointed composition. The assumption that we are whole, if complex and constantly varying, gives us a more direct and satisfying way to appreciate in practical terms, as well as in biological and philosophical terms, what it is to be an animate being. It may also help us understand why and how we humans tend to conceive of such bifurcations. My simple rule is that it is fine to use the word "embody" and its synonyms to give tangible or visible form to ideas, qualities, or feelings—a metaphorical use. Caution needs to be taken for uses that sever human identity objectively into essence and matter. To foreground moving bodies is to assume wholeness and health and to emphasize seeking the fullest appreciation and realization of being human.

6

Evolution
Feet, Hands, and Big Brains

The hand is not only the organ of labour,
it is also the product of labour.
Friedrich Engles

Life has existed on planet Earth for 4.3 billion years, animals for 610 million years, primates around 65 million, bipedal hominins for 4 million years. *Homo sapiens*, us newcomers, appeared in Africa at a time of dramatic climate change 200,000 years ago. The age of the universe is 13.8 billion years. I don't want to overwhelm with numbers, yet there is a feeling kind of knowing here. I include a numbered timeline to indicate that in the big scheme of existence human life as we know it is a rather novel development, a mere five one hundredths of one percent (0.0005) of the length of life on Earth, itself a relatively new planet in the corner of the Milky Way Galaxy, one of trillions in the universe as the new Webb space telescope is revealing. Physicist Alan Lightman described existence of life in the universe, writing, "That's [the existence of life is] like a few grains of sand on the Gobi Desert" (*Atlantic*). It is notable that the identity of our classification of life, *Homo sapiens,* was formally instituted in 1758 by Linnaeus. The term is Modern Latin, with *Homo,* as the designation of genus commonly rendered as "man," revealing the deep roots of gender discrimination since the Latin word designates human male. *Sapiens,* the species designation, is rendered as "wise." To repair the sexist bias and cast the species designation a bit more technically, we might refer to our

species as "Knowing Humans" or perhaps more accurately "Knowing Hominins." We are knowers. We are aware. We find ourselves to be at the center of existence—since it is us doing the knowing and, so far as we can tell, we are the only ones anywhere doing so—the rarest, oddest anomaly in the vast universe—a speck of dust on a speck of dust. In this reckoning I can't help but feel that being human is pretty much impossible, yet here we are.

I can't keep myself from a brief bit of enraged editorializing that this great span of development always incites in me. It is primarily since the Industrial Revolution in the eighteenth and nineteenth centuries and especially in the era of heavy reliability on fossil fuels over the last century that we have set in motion changes to planetary climate that will, over the next century, radically change, if not destroy, life as we know it. I'm stunned, and feel guilt and remorse and anger, that in the hundreds and hundreds of centuries of even human existence, this is the period, comprised of but several decades, that our own actions threaten our very existence and so few of us seem all that concerned, fewer still are those who think we should act. And what actions are taking place are directed to accommodating horrible change rather than preventing it. It seems we think moving to Mars is easier than saving Earth. We are the creatures who imagined building an instrument that allows us to "see" our cosmic history across thirteen billion lightyears. We built it and rocketed it millions of miles into space where we unfolded it and got it operational. We are the creatures so devoted to greed and shortsightedness and partisan loyalty that we are failing to act to stop the rapid deterioration of quality of life on our planet. The juxtaposition is astounding.

The human species has sometimes been designated differently to emphasize various ideas about what distinguishes us. The twentieth century French philosopher Henri Bergson (1859-1941) suggested *Homo faber*, toolmaker, and Johan Huizinga (1872-1945), the twentieth

century Dutch cultural historian offered *Homo ludens*, player. I particularly like that one, although I much prefer the understanding of play offered by the German playwright and poet Fredrich Schiller (1759-1805) in 1795. I suggest yet another option, *Homo motus*, mover, even if it doesn't adequately distinguish us among our animal kin.

A current philosophical trend is called posthumanism. While there is little agreement among these folks as to what they are about, posthumanism tends to focus either on displacing a humancentric view of existence, were that even possible, or on envisioning a time when human biology will be replaced by machines, AI powered robots, androids. A favorite notion, also popular in sci-fi fiction and film, is the downloading of the contents of a human brain into a synthetic body achieving something like immortality. I'm surprised that this philosophical movement has developed so vigorously since I feel it is based on a fundamental misunderstanding of humans as well as machines. I vigorously argue that we create and discover ourselves and our world in the experience of moving our sentient bodies, thoroughly biological if often enhanced by technology. Our brains are certainly essential to this process, yet without fleshy bodies brains are but a few pounds of useless meat. On the other hand, machine learning done by computers is based on their capacity to process huge amounts of data, whose significance humans must designate, based on algorithms that produce probability valuations. The error, in my view, of the futurists who believe in the eventual reign of machines—robots and androids, but not cyborgs since they are part organic—is that they assume that at some point, when data are sufficiently vast and computation speeds are sufficiently high, these machines become independent and self-perpetuating, even sentient. I hold that it is the feeling, reactive, messy experience of biologically active moving that constitutes the *sapiens* (knowing) distinction of our genus. Our knowing is, as I'll show, based more on feelings of coherence and rightness

than on reason and calculation. Processing speed and data, that is, information, are not what is fundamental. What we understand as knowing can only be simulated by machines. Machines can't feel because they are not organic.

As Charles Darwin (1809-1892) argued in his *On the Origin of Species* (1859) evolution is driven by adaptation and survival. I'm not interested in charting some phylogenetic "Rise of Man (sic)" argument. I want only to focus on the general discussion of the specific biological features I think are essential to the *sapiens* species designation. It is also fascinating. Comparative skull evidence shows an enlargement over time of the vault containing the brain. Certainly, having a big brain is essential to the sort of knowing we attribute to humans. Yet, recent scientists have argued that upright posture and the accompanying style of motility were essential to the evolutionary development of modern humans. With upright posture, the front legs of quadrupeds become arms ending in hands and fingers. It must be hypothesized that the development of the distinctive structure of the human hand is fundamental.

It is difficult for me to see any of these—hands, feet, big brains—developing independently or any one of them leading to the others. It seems elementary evolutionary biology that the full development of any of these body features needed the simultaneous development of both the others; indeed, the development of the whole human organism. It seems clear enough that, in line with the evolution principle of adaptation and survival, there had to be survival advantages for a sequence of biological development-related adaptations over hundreds of generations. As animate organisms were moving about the environment, some surviving others not, there were evolutionary adaptations enhancing the potential for survival linked to traveling in a style enabled by an upright posture, dependent on an explicit foot structure, with hands developing to be capable of grasping (opposable thumbs) and performing fine motor skills needed to make and use tools, both developing only

when accompanied by an expanding brain. The common element, the factor that made the organism cohere, was the moving and the style of moving that led to or was inseparable from these linked adaptations. Moving is the force requiring organic coherence. My indication that moving—an action rather than a body part—has primacy in the creation and discovery and evolution of ourselves and our world may at first seem merely propositional or even a bit sketchy. Yet, in evolutionary terms I mean the statement quite literal. The physiology of hands, feet, big brains—comprising distinctions of our human biology—is the result of adaptations achieved over many generations of moving.

The French paleontologist André Leroi-Gourhan (1911-1986) made a powerful adaptation to scholarly technique by shifting from exclusive focus on the materiality of early human tools, spear points and the like, to considering the gestures required to both manufacture and use these tools. What was important to Leroi-Gourhan was the body structure and mechanics that supported the gestures—such as moving in a posture that enabled visual advantages, overhand throwing, striking—required for making and using these tools. He placed emphasis on the biological structural details of the moving organism involveed in specific gestures. To remain on a general and practical level, with this phylogenetic background sketch, I want to briefly reflect on the structure of human hands and feet and their link to the species designation. I suggest that ancient wisdom is expressed today by that sweet practice of counting the fingers and toes of the newborn. This act carries the wisdom that the structure and capabilities of human hands and feet are essential to the species distinction, Knowing Humans.

I have scoured philosophy for discussions of hands and feet. While I have found, especially among phenomenologists, significant discussions of hands, it is rare to find references to feet. I've been inspired by the late French philosopher Michel Serres' (1930-2019) appreciation of the

philosophical significance of feet. He often refers to the gymnast and the alpinist (hiker).

While upright posture does not offer an increase in speed—cheetahs are faster—it offers enormous flexibility in balance, speed of directional change, and adaptability all made possible by the evolution of human feet. As the foundation of posture and gesture and moving, the feet are constantly connecting us with our physical environment. Our foundation. The foot is a remarkably complicated structure with 29 muscles and 59 bones. It has phalanges (toes) offering enhanced balance and enormous adaptability. It has a three-point sole structure offering stability for balancing on one leg, essential to walking and running and turning. We humans can not only turn on a dime, that is promptly change directions in a small space, we can also spin and dance and leap and climb and stomp and sprint and balance on the toes of one foot. The evolution of the foot enables upright posture which lifts the head to the top of the spine and a neck (also ignored in philosophy, unfortunately) with a flexible curve and structure that allows twisting and bending. Upright posture places greater emphasis on the sensory capacities located in the head and face. It promotes a distinction between head and body—the neck—that has enormous implications regarding the way we understand ourselves and it relates directly to why we consider the head the locus of our knowing. Without necks, we might be toads.

Accompanying the development of feet and upright posture, the forelegs develop into arms with brachiation movement capabilities, that is, overhead arm movement, that allows swinging supporting the full body weight and overhand throwing. Hands comprised of fingers and opposable thumbs eventually develop. Rivaling the feet is the complexity of hand physiology with 30 muscles and 27 bones. Fingers are essential to support hanging body weight, yet the opposable thumb is a major evolutionary development. The human opposable thumb can touch the

tip of each of the related four fingers thus offering remarkable dexterity, the development of fine motor skills.[8] With the feet, head, face, and arms favoring one direction, and that direction is the favored direction of moving, our moving experience translates conceptually in a preference for forward, ahead, in front, also for up and above. The area of outstretched arms in front of our faces and chests creates a beachball-shaped sphere is the anterior space where much distinctively human movement and behavior occurs. Our opposable thumbs enable the physical act of grasping, a highly developed distinctly human capability. We can grasp spears and throw them overhand. We can thread a needle. Consider the concept *to grasp*. We so often use this term with no connection to the structure of our hands with fingers and opposable thumbs. We grasp an idea. We grasp the significance of a situation. Surely the concept, so commonly used metaphorically or as an abstract concept, could only arise in the development of language and knowing as the result of the distinctive structure of human hands. It is incredulous to think that the grasping movement of the hand is only learned when based on the prior existence of the abstract concept *to grasp*. I'm stunned by the amazing process gradually unfolding over a very long time from grasping a spear to forming the concept to grasp and the words to communicate it. The whole human story might be adequately told in the terms of the single appendage of the hand. I argue that all concepts are corporeally based, that is, arising from the experience of our moving bodies. The fundamental corporeality of concepts grounded in the experience of moving is stunningly innovative.

When we think of the vast time it took for the evolution of the human hand and foot we must appreciate that developing in parallel were capacities for complex concepttual thought and language, that is, for knowing. The

[8] See also, Michael Corballis, *From Hand to Mouth: The Origins of Language*, 2002 and Raymond Tallis, *The Hand: A Philosophical Inquiry into Human Being*, 2003.

neurological development necessary to support the skilled movings of feet and hands and bodies extend into every muscle and joint but also in the development of a brain and central nervous system comprised of 85 billion neurons. Indeed, the detailed structure of the human body is mapped onto the brain itself in what we commonly refer to as homunculus ("little person"). Our brain is in our body; our body is in our brain.

The eons of adaptation in movings, each confirmed by its service to survival, accounts for the evolution of feet and hands and big brains and bodies and concepts and language. By any measure this development, these gifts, are nothing short of splendid. Shaped by the force of self-moving, we have evolved as a coherent self-knowing organism, also capable of dreaming of and investigating the stars. And these two vastly different capabilities are the same. We are indeed *Homo sapiens*, Knowing Humans.

7

Proprioception

There is nothing in the mind that
has not been first in the senses.
Gottfried Wilhelm Leibniz

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

French philosopher Étienne Bonnot de Condillac (1714-1780) published *Treatise on Sensation* (1754) in which he asked, "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?" His concern was shared by his contemporary Linnaeus who in 1758 would name our species classification Knowing Humans (*Homo sapiens*). Condillac turned to a thought experiment first proposed in the late tenth or early eleventh century in central Asia by the philosopher Avicenna. Beginning with the assumption that one must first know oneself, or be aware that one exists, before knowing anything more, the idea was to consider "a statue organized on the inside like ourselves, and animated by a mind deprived of any kind of ideas." The exterior of 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." Fascinatingly, Condillac suggested that this marble creature would only need a moving hand. Like a groping infant, the hand will inevitably touch its body and by this moving/touching

alone it discovers that it has a body. "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," he wrote. I take the liberty to italicize the phrase "sensation of solidity" because it seems a reference to mass, which, centuries later it will be discovered is sensed in the body only by proprioception, as I'll discuss.

Half a century later, another French philosopher, François-Pierre-Gontier de Biran, known as Maine de Biran, (1766-1824) critiqued Condillac's position in his *Essays on the Division of Thinking* (1804) writing, "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." In other words, one need touch nothing, the very feeling of moving itself and the feeling of the effort to do so is all that is needed to know thyself. This is a reference to what, centuries later, will be referred to as "kinesthesia," the feeling aspect of proprioception, which I will discuss. Touching is not actually excluded since proprioception has sometimes been referred to as "inner touch." The importance of this remarkable, if ignored, sensory faculty cannot be overstated.

From at least the mid-eighteenth century there have been important philosophical concerns with how humans come to know anything at all, including themselves. Notably the early philosophical discussions placed primacy on self-moving and the accompanying sensations. As Brian Massumi wrote of body, "It *moves*. It *feels*. … it feels itself moving." Philosophy anticipated the scientific discovery of the necessary biological mechanisms involved whose discovery would unfold across the nineteenth century. In 1826 Scottish anatomist Charles Bell (1774-1842) proposed what he referred to as "muscle sense." In the 1880s Henry Charlton Bastian (1837-1915), English neurologist, proposed the term "kinesthesia" that we now associate with

the feeling of moving based on his discovery that information is provided to the brain from sensors, proprioceptors, in the tendons, joints, and muscles. Finally, in *The Integrative Action of the Nervous System* (1906) renowned English neurophysiologist Sir Charles Scott Sherrington (1857-1952) described this complex sensory system, including proprioception (a term he coined), interoception, and exteroception.

Cogito, ergo sum, "I think, therefore I am," attributed to French philosopher René Descartes (1596-1650), often cited as influencing our common practice of giving primacy to brain/thought over body, and our common tendency to separate mind and body, was followed in subsequent centuries by both philosophical argument for and physiological counter evidence of the essential involvement, even primacy, of self-moving in human knowing, that is, that the functions of thinking and knowing cannot be adequately accounted for without self-moving. It is, I think, unfortunate that this established moving-centered philosophical and scientific understanding has, over the centuries, had so little impacted the broadly held folk and academic understandings of us humans as knowing beings.

Sherrington's term "proprioception" (Latin *proprius* "one's own" and reception) indicates self-perception. I know of not a single published work outside scientific reports on physiology and medicine—that is, the literature of philosophy and the humanities—that describes proprioception in even a bit of physiological detail. It does not seem a word widely known in the general or public vocabulary. Most who know the word associate it primarily with awareness of body position and linked to balance; some might understand its function primarily as preventing bodily injury. I risk the overwhelm of data in offering a general description of muscle sensory systems including two types of proprioceptors largely because, to me, it helps us understanding and appreciate the mechanics and the experience of self-moving and its primacy to animate

organisms. To know, even in general terms, how our bodies move, to understand the constantly and near instantaneously monitoring and influencing of moving, and to learn the mechanisms by which we feel ourselves moving is, I believe, essential to understanding how utterly remarkable is moving and how foundational it is to both animate life in all forms and to appreciate the moving potential highly tailored to human beings.

Sherrington's discovery was linked to his study of the knee jerk reaction we all have experienced. It may be induced when a physician taps on the tendon below our kneecap resulting in our foot, without our conscious direction or awareness, surprisingly jerking. This reflex, referred to as a stretch reflex arc, is a measure of neuromuscular health. Sherrington was concerned with the neurological stimulus-response connection of nerve to muscle (how utterly remarkable this is!). Sherrington hypothesized the connection as occurring in what he referred to as "synapse" (Greek "to clasp" or "join together") which has come to be appreciated as foundational to the neurological system. The neurological connection to muscle action led him to the hypothesis of a neuromuscular sensory system—that is, proprioception—that monitors our moving bodies. For Sherrington self-moving has a primacy in understanding body agency, feeling, action, and identity.

Various sensory organs and systems in the body, including eyes and the vestibular system in the ears, have a proprioceptive function helping us know ourselves and to locate parts of our bodies as they move in their environments. I will give outline descriptions of two types of proprioceptors located in the muscles and joints that work both independently and together.

Consistent with intuitive and common expectations, we have a muscle system with muscle fibers connected to the motor cortex and the spinal cord. The muscles are also connected to bone by ligaments, comprising the skeleton-muscular system essential to moving. We have agency over

some of our movings. We decide or have a need to reach for a glass of water or to catch a ball. Other movings occur as part of our autonomic system, reflexes, or gestures (synergies). This muscle system is called the *alpha* system.

The motor programs, either innate or learned, in the sensory motor cortex stimulate the coordinated contraction and relaxation of the related muscles necessary to accomplish the desired moving. To move with accuracy and with smoothness and control, the muscles must have a sensory system that constantly monitors and adjusts the moving in progress including the effects that invariably involve interaction with the world—the glass, the ball, gravity, and so much more—and the internal health, fatigue, and other conditions of the body. This sensory system, likely surprising to many of us, constitutes a second neuromuscular system, *gamma*, located within the alpha muscles and in the ligaments. A dramatic example of how this sensory system adds information otherwise not available to any other sense is the evaluation (sensation) of mass. Consider, for example, two balls that appear identical but have vastly different masses—two tennis balls, one filled with air, the other with lead. Since mass is invisible, vision cannot distinguish between the balls, yet encountered by the body, one ball would *feel* light, the other heavy. As a reminder, *mass* is volume times density, whereas *weight* is the effect of gravity on mass. That means that mass remains the same for these two balls, whether on earth or on the moon, while they would weigh only one sixth as much on the moon as on earth. Mass is basically *resistance to moving*. The alpha system is not built to react to these conditions of encounter leading, if on their own, either to a vast overreaction, batting the air-filled ball in the air, or to the possible tearing or injury of muscle or ligament (what we commonly call a sprain) should the alpha system anticipate by visual cues an air-filled ball, yet encounters the lead-filled one.

What has evolved—indeed, the neurological evidence suggests that it is the older system—to deal with these issues

and so many others essential to skilled, healthy, and efficient moving is a second independent, yet entwined, muscle system, called *gamma*. This system is comprised of a sophisticated sensor system located within and throughout the alpha muscles and in the ligaments that connect muscle to bone. These interactive sensors comprise the system called *proprioception*.

The muscle sensors are commonly called *muscle spindles* because they are sheathed bundles of several muscle fibers that are spindle shaped being thin at the ends and bulging a bit in the middle. The spindles exist throughout the alpha muscles to which they are attached. The afferent (brain/chord directed) ends of nerve fibers are coiled around each of these spindles. These neurons synapse with motor neurons that connect to the alpha muscles in both the cord and the ganglia (clusters of nerve cells) located in the brain stem and elsewhere in the nervous system. Among many functions, especially the autonomic ones, the brain stem, located where the cerebrum connects with the spinal column, is of prime importance in the conveyance of motor and sensory pathways from the rest of the brain throughout the body (efferent), and from the body back to the brain (afferent). As the spindles are attached to the working muscles, they contract and expand along with the working alpha muscles. The axon sensors, known as *annulospirals*, are sensitive to the changing gaps in the coils of the nerve fiber wrapped around the spindles, thus sensing the change in *length* and the *speed* of change of the actual moving alpha muscle.

A second type of sensor, called the *Golgi Tendon Organs* (GTO), is in the connective tissue, collagen, that attaches the muscle to bone. These sensors are afferent nerve fibers that synapse with motor neurons in the cord, brain stem, and elsewhere. Arranged in zigzags, crosswise to the direction of force, these sensors are sensitive to expansion and contraction—the distance between zigs and zags—due to the pull of the alpha muscles on the tendons connecting

to the bone. The GTOs are designed to sense *tension* and *force*. The GTOs sense the *resistance* within the skeleton-muscular system associated with the ongoing moving.

The spindles and GTOs work together in sophisticated ways. Both the spindles and the GTOs synapse with the motor neurons of the alpha muscle and with each other. The spindles sense *length* and *speed* while the GTOs sense *tension* and *force* or *resistance*. The spindles have an *excitatory* function, causing alpha muscles to contract, while GTOs have an *inhibitory* function causing alpha muscles to relax. Together, in concert, they function to sense the *net work force* delivered by the muscle and make constant adjustments necessary both to prevent muscle or ligament injury and to refine the muscle action to the moving in progress. *They sense moving, not as a change in location, but as the dynamics of the ongoing moving including the effect of the body's encounter with the environment in which the moving is occurring*, like the mass of a ball as it is being caught. They also monitor the execution of sensori-motor programmed patterns of movings—synergies—innate, socially developed gestures, and individually developed skills. They are the only sensory system to measure pure mass as a factor in moving encounters. Since these proprioceptors communicate with the sensory and motor cortex and the cerebrum, they are active in both the consciously directed movings as well as the bulk of movings that are silently functioning. These silent actions are far too complicated, and they function far too fast for conscious direction or even awareness. The vastly complicated system regulates the interaction of mood and emotion with moving and its execution; moving is affected by mood and emotion as emotion and mood are affected by moving. The system is essential for tonus (readiness), posture, smoothness and refinement of movement, prevention of injury, the linkage of mood and emotion with moving.

The synaptic criteria—the incredibly sensitive control of the specific motor synapses—are influenced over time by repeated gestural proprioceptive information about

moving experience (LeDoux, 2002 & Edelman, 2006), that is, the self-moving body encountering the world. Proprioceptive information refines the anticipation of repeated movings (Berthoz, 2000) resulting in greater acuity and skill as well as the profiles by which we identify (know) objects and situations.

As we begin to appreciate the vast involvement of this proprioceptive system, it makes sense that one third of all gamma motor neurons are required for proprioception. I've offered but the scantest overview of the amazing roles and capacities of proprioceptors, described as simple as possible despite the systems being unbelievably complicated, hopefully accurately communicating the basic functional elements. I suggest that even this most elementary sketch serves us well as I consider, in other essays, many aspects of self-moving.

I propose the muscle spindles and the GTOs as the "poster children" that exemplify the wholeness of the animate organism. They highlight the entwining of the systems comprising the organism demonstrating that the wholeness is inseparable from self-moving. From the perspective of physiology, proprioceptors are the conjunction of nerves and muscles, the nervous and the skeleton-muscular systems. They emphatically refute Cartesian dualism since proprioceptors, comprised of nerve fibers and muscle/collagen, are the physical integration and identity of nervous system and skeletomuscular system. Proprioceptors literally entwine nerve, muscle, and connective tissue; thus, they demonstrate the complex unity of organic systems in service to its capacity and necessity for self-moving. These proprioceptors are also essential to the encounters with the environment that occur in the self-moving process. As Condillac suggested, it is the *solidity*, the mass, that is sensed as the body encounters itself when touched by the hand—a primary function of the proprioceptors—that is an originary act of self-knowing, opening the door to all knowing. The same touching/moving

encounter has primacy in knowing the world. And as Main de Biran suggested self-awareness is born even in moving a hand without external encounter, for such moving involves the interaction of *effort* and *resistance,* a symphony of inner touching proprioceptive sensations, kinesthesia, of even the simplest effects of gravity on moving.

8

Freedom in Moving

Feminist writer, Iris Marion Young, wrote an essay titled "Throwing Like a Girl" (1990) challenging this pejorative gender stereotype yet she also asked why in general girls use a different style of throwing than do boys. In my 2012 book *Dancing Culture Religion*, I took up this stereotype and the parallel gender view that is perhaps not uniformly considered pejorative, "real men don't dance," or, to stay parallel to Young, "dancing like a boy." I recounted the example of a contest pitting female underhand softball pitcher, Jenny Finch, against a major league male baseball pitcher to see which one could throw the fastest pitch generating the greatest impact force. The male pitcher went first throwing in overhand style a 90 plus mile per hour baseball to hit the sensor designed to measure the force. When Jenny threw her pitch, in the underhand female style, the larger so-called softball shattered the sensor. There are many ways to move one's body to throw a ball at great speed and accuracy.

I, of course, took up the "real men don't dance" stereotype as well recounting that in my many years of teaching social dancing to males and females, it is undisputable that men in the general American population have more difficulty dancing and learning to dance, and they have far less enthusiasm and interest in dancing. It is common for males to express scorn for dancing and any male who dances. My dozen years associated with youth competitive dancing, more than 95% were girls. Yet I note that in many cultures the world over men are enthusiastic and accomplished dancers and even in contemporary Western settings a large portion of dance teachers and

renowned choreographers are men. More relevant to my present concern ballet attracts mostly females and breaking (break dance) mostly males. The general point is that there are a great many ways of moving that are graceful, beautiful, powerful, and enjoyable. Some have strong gender identities.

The moving body has remarkable freedom. The performance of any motion can be achieved in seemingly endless ways despite the rigidity of bone, the design of joints for specific restricted movings, and the structure of muscle. I often consider dancing to be an exploration of this freedom of moving; perhaps better put if a bit clinical, dancing is in this respect creatively negotiating the freedom and restriction inherent to human biomechanics. Dancer/ choreographer Rudolf Laban (1878-1958) studied bio-mechanics to develop a system, Laban Movement Analysis, that articulates the variables in the four categories: body, effort, shape, and space. He also developed a remarkably complex system of movement notation, the counterpart to the more familiar music notation.

Apart from throwing and dancing, we can test this freedom for ourselves. Simply hold your arm fully extended forward. Move your finger to touch your nose. Try it exploring change of position and varying engagements of shoulder, elbow, wrist, hand, fingers. Explore different speeds and intensities of moving. Explore different routes for the finger to travel to get to your nose. You can move rapidly and forcefully or slowly. You can take circuitous routes or move through the shortest path. You can move your hand first followed by arm or the other way round or both at once. Notice how remarkable it is that despite all this freedom, your finger successfully arrives at your nose, without missing it or poking you in the eye or ear. You can do this exercise with eyes open, but also with eyes closed. Notice also that no matter how you move, if you do not intentionally introduce jerkiness, the trajectory of finger to nose is smooth. When we allow ourselves to be aware of

the kinesthetic sensations of moving, we are likely thrilled by the persistent efficiency and smoothness of all the variations. We can feel this efficiency and ease across the ranges of freedom. Imagine how it would feel if on these various efforts most of the time you missed your nose, poking yourself in the eye! We soon appreciate that there is enormous freedom in the way we coordinate shoulder, elbow, wrist, hand, and fingers engaging dozens of muscles and millions of proprioceptors, along with sight, balance (vestibular system), and kinesthesia (the feeling of moving). Yet, as surprising, once we are aware of the degrees of freedom, if simply asked to extend the arm and then move to touch the nose with the finger, there is little difference in the way most people move. The smoothest most efficient path is taken. Biomechanics influences common movings based on efficiency and simplicity and those are invariably smooth.

Russian neurophysiologist Nikolai Bernstein (1896-1966), who studied moving for decades, was interested in this freedom, coining the phrase Degrees of Freedom (DOF). He also introduced the term "biomechanics." Prior to the advent of computers, he was the first to design methods of recording the trajectories of moving to support his studies. He wanted to understand how the central nervous system could possibly coordinate the enormous complexity of variables essential to the performance of coherent and successful moving. He was also concerned with what principles emerged as default patterns of moving for specific common tasks. Bernstein's insights, based on his several decades studying moving, remain groundbreaking, despite the advancement of tracking sophistication enabled by computers as well as the major advancements in neuroscience. We are all familiar with the computer tracking of moving accomplished by dancers and athletes, with sensors attached to many parts of their bodies, moving through a task with the computer showing light trails accurately tracking all the details.

Although rarely mentioned when addressing moving, there is another factor, neurotransmission speeds, that adds complexity and confoundment to our appreciation of the degrees of freedom of moving for animate organisms. Not to overwhelm, I recount complicating factors because I want to share the basis for my profound appreciation of moving and its importance to understanding ourselves and our animal kin. Forgive me for entering the edge of the weeds (really flowers) of transmission speeds in the nervous system. Information is carried throughout the nervous system along the pathways of neurons linking one another and with muscles and sensors in remarkably complex neuro networks. Humans have around eighty-five billion neurons. Each neuron has a cell body (soma) with extensions outward throughout the human body of varying lengths from a millimeter (0.039 inch) to a meter (3.28 feet). One end (axon) initiates contact with the receiving end (dendrite) of another neuron across a tiny gap (synaptic gap = 20 to 40 nm, a sheet of paper is 100,000 nm). Chemicals (neurotransmitters) are released from the axon, cross the space of the synaptic gap, enter the dendrite side of another neuron and are then withdrawn. This gap crossing constitutes a synapse. There are some 500 trillion synaptic connections in the human body. When the neurotransmitter enters the dendrite, it causes the flipping of the charge on adjacent ions in a cascade effect (called *action potential*) along the length of the neuron, thus carrying information, a momentary change in charge.

While variable, neurotransmission/action potential speeds are often stated as being around 250 miles per hour, yet they vary from as slow as one mile per hour. While it is the rapidity that is usually and rightly the focus when speeds of neurotransmission and action potential are discussed—we often use terms like "lightning fast" and analogies to electric wiring—what has persistently fascinated me is just the opposite, the relative slowness as well as the variability of speeds. Were these speeds equivalent to electricity, as

implied in our common reference to "wiring" and "firing" as an analogy to the nervous system and "lightning" as a metaphor, speed would not create an issue. Well, there would be plenty of issues, but 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 huge difference to me and a significant one. The relative slowness of information travelling in the nervous system is why we have observable reaction times even in a reflex arc that goes only from point of stimulation, say the tap of a mallet on the tendon below the kneecap, to the cord and directly back to the associated muscles, say the muscles that jerk of the foot. Why is speed and distance of neurotransmission significant? Recall that sound, that travels at around 750 miles per hour, takes around five seconds to travel a mile. Light travels at around 186,000 miles per second (give or take), covering a mile nearly instantaneously. We have all, after seeing lightening flash, counted "steam engines" or "Mississippis" until we hear the thunder to estimate how far away was the lightning strike. Distances in the body across which information must travel are significant at the relatively slow speed it travels as is the wide variation in speed. At neurotransmission speeds it would take fifteen or so seconds to travel a mile.

The complexity of coordination throughout the organism introduced by this slowness and variability of neurotransmission/action potential speed is, to me nearly unfathomable. Bernstein was concerned with the coordination constantly demanded throughout the entire body. The coordination dynamics he studied for decades came to be known formally as Bernstein's Problem. Recently an entire field called Coordination Dynamics or Dynamic Systems, has developed to study such complex systems both within the body and within culture and history.

The variability in speed and responsiveness might seem to present a problem for moving yet were moving a rigid mechanical electronically controlled system it would

produce robotic movement without the capacity to innovate or smoothly adapt. As Esther Thelen and Linda B. Smith (1994) 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.[9]

The ongoingness of moving requires coherence among variables. Could a more profound insight exist?

Fortunately, our moving bodies come equipped with and are able to learn to manage the complexities of coordin-

[9] Thelen & Smith, 77. Amazing progress has been made in robotics by engaging techniques of machine learning based on enormous data sets assisted by advances in sensors and servomotors. DeepMind has designed what I'd call a meta-algorithm that allows a simple robot performing functions with pincers to adjust the algorithms controlling its own actions based on the success and failure of its actions. This feedback loop seeks self-adjustment like proprioception. There is a fundamental difference between the organic processes that engage constant monitoring and adjusting in process of a true proprioceptive system and the adjustments to an algorithm made by a meta-algorithm. The distinction is that robotic moving is essentially an imitation of, rather than a replication of, human moving.

ation for much of our moving without our conscious direction or awareness. Were conscious control necessary, we'd likely need a brain the size of a barn and at that we'd only be capable of lumbering awkwardly about. Yet, it is equally as amazing that we can direct and control our moving at various levels as we choose to do so, and we can elect to control or exert input at various levels from how we move a finger to how we pitch a ball and how we perform a dance. Much of our lives is involved in the negotiation of when and how much to control and direct our own movings.

As we set about appreciating the distinctiveness of the human species among the various genera and species of animate organisms, the degrees of freedom of movement extending across the human body are distinctive. The degrees of freedom have been shaped by evolution, by history, and by individual behavior constantly repeated over time. Humans have the distinctive capacity to consciously control, to feel (both kinesthetic and emotional), to objectify, to philosophize about, to scientifically study every imaginable (a word with notable implications) aspect of moving. As we engage in the refinement and development of our moving possibilities in emerging individuality, practicing cultural identity, gaining skills of unimaginable varieties, and resolving malfunctions injuries and problems in moving, we most certainly are heartened and humbled by the sheer complexity of the system and the vastly complicated challenge of coordination dynamics. I am at once in awe of our moving bodies, and I am thrilled with the possibility and potential for exploring the degree of freedom in movings.

An aside: Quite popular in film and fiction are imagined near future worlds of androids and robots (synths). A common theme is to upload the identities, usually confined to the brain content, of humans into these made beings. I love this genre and the idea that humans as makers imagine themselves capable, outside of reproduce-

tive biology, of this sort of achievement. The idea of making a body indistinguishable from a human body has been around since antiquity, a history that I consider in some depth in my 2018 book *Religion and Technology into the Future: From Adam to Tomorrow's Eve*.

I've had a rather different response to the recent explosion of a branch of philosophy identified loosely by the term "posthumanism." Some of these philosophers share some ideas with a few futurist scientists. The philosophers seem interested in de-centering humanity in the discourse about reality, yet apart from fictional androids that imitate being human their futurist imaginings of what species follows *Homo sapiens* remain vague. The scientists seem bent on the proposition that follows on Moore's Law that has been popular and useful since the advent of the late twentieth century idea that computers somehow think. To me thinking is rather different than calculating. In the beginning due to the advancing miniaturization of transistors, the heart of computers, and the accompanying advancement in speed and memory (as it is called) in computers, Moore's Law predicts a doubling of speed and capacity approximately every two years. The law has proven roughly accurate. This measure of increase may not seem like all that much, but mathematically a doubling every two years for fifty years, twenty-five doublings, amounts to an incomprehensible number. The imagined posthuman world based on this trajectory assumes that at some point (referred to as "singularity") in this exponential increase machines will gain intelligence (AGI, artificial general intelligence) superior to human intelligence enabling them to become independent and capable of self-replication. Machines will be superior to humans (posthumans). In one scenario human identities gain effective immortality by being uploaded into durable synth bodies. Alternatively, humans are either killed off or become pets of the AI-robots.

I do not think intelligence or anything even remotely equivalent to human capacities to move and feel oneself

moving can ever be achieved merely by the increase in calculating speed and storage capacity of a machine. After all, what I have discussed above is how the organic body is capable of incomprehensible coordination and I think this distinctive capability is due to the relative slowness of speeds, the ongoing adjustment of organic processes to nonlinear conditions, and the feeling agentive role in this system rather than to high calculating speeds and data storage capacities. Human distinction is inseparable from incongruity, nonlinearity, random variations, and certain inefficiencies and redundancies all remarkably obvious in the gooey juicy composition of our bodies. Electronically based machines, all clean and clinical, only imitate the marvelous and extensive degrees of freedom of the organic. I know of none of these futurist studies that has considered the daunting task of even vaguely comprehending the body systems involved in the coordination dynamics necessary to enjoy the freedom of moving that characterizes the clumsiest of human bodies. I think this difference is why I so love the imaginations portrayed in film and fiction. They introduce the creative encounter with the impossible.

Humans may be distinguished from posthuman AI/robot synths this way: a machine is designed to imitate human movement; the human animate organism is designed by the forces of its ongoing living movings.

9

Synergies & Schemas

In the beginning was the deed.
Goethe, *Faust*

I have often hiked in the Rocky Mountains and many other natural areas including over a nineteen-thousand-foot pass on an Annapurna circuit trek in Nepal. While hiking I've occasionally reflected on our ability to tramp along at a good clip only glancing now and then at the path ahead. I have also mountain biked some hairy trails in Moab and around Colorado. Many of the trails I hike are rough and rocky. My contemplation: How is it possible that, with but an occasional glance and no obviously conscious decisions, my footfalls hit stable places with almost perfect accuracy including evaluating stability and heights of rocks and roots and obstacles protruding in the trail? It is essential that my body sees, evaluates many variables while it projects and plans a route, and executes it by adjusting length of stride and location of footfalls with every step. I am capable of this precise planning and execution constantly updating as I proceed along the path. Doing this remarkable task does not require much attention since I can simultaneously chat with a friend, eat a snack, enjoy the wilderness, and think about what I'll do tomorrow. It is rare that I stumble or lurch because I miscalculate trail conditions.

Add to this hiking scenario another observation that causes me pause. We often observe footage taken with a small video camera like GoPro by people walking or running down a trail or perhaps riding a mountain bike on a rough trail. We also often see video from body cameras.

When I see these videos, I'm shocked by how jerky they are. I struggle amidst all the jerkiness to make sense of what I'm seeing. Yet, when I run or bike a trail, I don't experience this jerkiness. What's the difference?

Another example. My granddaughter is a dancer and often performs on stage. I have often marveled at the simultaneity of a group of dancers performing, but also how the group adjusts to the relative size of the performance area. Should a group of dancers perform in a small space and, on another occasion, the same dance is performed in a large space I am astounded that their dancing fills both spaces, without seemingly the dancers having to give conscious awareness to the essential adjustments. Yet these adjustments are remarkably complex involving not just a single dancer altering how she moves in her space, but the whole ensemble doing so simultaneously keeping track of the whole area, the spatial relationality among all the dancers in the space while remembering and performing the choreography together and to the music.

These examples may seem to focus on exceptional moving processes, yet these complex processes are involved in the banal movings of all animate organisms. A simpler example that sometimes renders me stationary, frozen in contemplation, is walking across the room to then ascend stairs. Surely, I have an average length stride and when I walk it seems to me that my strides are consistent in length. Given my initial starting point, if I were to simply chart out on paper these strides to cover the space to the base of the stairs, only a relatively small percent of the times would the steps arrive precisely located to take the first step up. Most of the time the charted last step would need lengthening or shortening to arrive at that proper location. Yet my experience is that no matter where in the room I start, I always arrive at the base of the stairs at the optimal location without having to adjust that last stride, or any others so far as I am aware, to assure proper location to easily ascend the stairs. Add to that, I'm pretty sure I usually take my first

step up with my right foot. How does that work? Did anyone teach me how to do this? I don't recall a day when my mom said, "Ok, now that you have mastered walking, let's work on arriving precisely to the base of the stairs." It is accomplished without thought or plan, seemingly so simple, invariably error free, yet analytically remarkably complex.

As with most everything related to self-moving, I'm enthralled. Specifically, what these examples suggest to me is that the biomechanics of moving require a complex system involving the entire organism that is capable, with but modest involvement of conscious control, of constant and ongoing planning, anticipation, assessment, and adjustment. No full analysis is possible—the system is simply too complex—and, in my reading, the most advanced science has so far articulated but general aspects of this capacity. I want to focus on the most general characteristics of this process that has been referred to as synergies.

The Russian physiologist, Nikolai Bernstein proposed that evolution has created synergies (*syn* = together; *ergos* = work) that are comprised of elements of biomechanical functions that "work together" as units (synergies) to simplify moving. There are extensive repertoires of synergies. Some are innate to a species having evolved across eons. Others are formed as patterns repeated in the common movings essential to life or are learned as gestures and skills. Neuroscientist Alain Berthoz summarized the general characteristics of synergies in his 2000 book *The Brain's Sense of Movement.*[10]

To differing degrees species have evolved with built-in synergies that are present at birth. A foal is capable of not only walking but also running almost immediately at birth. Yet it takes a human infant much of a year to go through

[10] See also Thelen and Smith, "Ch 4: Dynamic Principles of Development: Reinterpreting Learning to Walk," in *Dynamic System*, and H. Haken, *Synergetics: An Introduction*. Heidelberg: Springer-Verlag, 1977.

the various stages of development to finally take its first tentative steps. These complex motor processes are possible only because various interconnected systems that comprise biomechanics create synergies, something like program modules or sub-routines or schemas or macros, that operate individually or in groups, in parallel or in series, functioning simultaneously or sequentially to achieve the demands of ongoing moving tasks.

While it is overwhelming to attempt the most general biological account of this remarkable process, there are a few general characteristics of synergies that are essential to our understanding of moving. One of these is represented by Berthoz's quotation from Goethe's *Faust*, "In the beginning was the deed." What is implied here is that synergies are constructed, on the one hand, in the evolution of species to enact the movings distinctive to the species. Foals can walk and run soon after birth because the survival of their species depended on the evolution of these synergies. Yet, from the ontogenetic perspective and focusing on the importance of synergies to humans, while humans are born with some synergies already formed, throughout much of life the repertoire of synergies is regularly expanded and specific synergies refined based on what each of us, within our life stages and historical cultural environments, does or choses to do. This process of expansion and modification underlies not simply the obvious acts of locomotion such as walking, running, climbing stairs, but also those we commonly think of as gestures, habits, practices, lifeways, and skills. In doing our deeds and learning to do them coherently and efficiently, we create and constantly refine synergies. In turn the developing synergies function as we repeat these deeds again and again. The very endurance of synergies across time is how moving patterns become naturalized to us, that is, how they come to feel natural or just-so.

We all know the term "muscle memory" used to refer to the seeming automatic performance of learned moving

patterns, especially skills. This "memory" is implicated in such familiar phrases as "it's like riding a bike" which means once one learns to ride a bike one will always be able to ride a bike. Learning to ride a bike is often jerky and occasions of skinned knees. Yet, once learned it just seems to happen. While the term "muscle memory" is just fine since it does seem that our muscles remember, I think it is at least important to understand that it isn't really our muscles remembering all by themselves. And memory, as in recall of a past event, isn't quite accurate either. I much prefer to irritate Descartes by emphasizing the necessary involvement of the whole organism recognizing the many systems of remarkable complexity coordinating together in constructing and modifying synergies and schemas that allow us freedom from conscious direction of the elements of all our movings. And thanks to kinesthesia we can feel ourselves moving.

Berthoz's discussion of synergies shows that they function in the present having been constructed over time based on repeated action patterns, yet they also constantly anticipate the future. That is, as the needs of life invoke a given synergy or complex of synergies, these synergies have the capacity to anticipate what will occur at a future point. When you think about it, synergies cannot even be selected without this capacity for anticipation. Thus, because synergies are selected and initiated and function over an interval of moving, we can smoothly hike or bike a trail of many obstacles, we can race across a tennis court and swing a racquet to return a ball and we are able to accurately and smoothly walk across the floor to climb a set of stairs. Synergies are constructed and refined as experience or memory. Yet more than *memory* synergies are constantly enriched by ongoing experience. And as memory suggests from the past, synergies also anticipate needs of upcoming movings. It is more than *muscle* in that it involves the entire nervous system (central and peripheral) as well as alpha and

gamma muscle systems. And much more. This common capability of moving is remarkable, isn't it?

On various occasions I've described the human experience of time using the term "fat present." I have suggested that any present awareness requires the engagement of what we acquire as raw sensory input must occur in the context of past and future (memory and imagination). It is through comparison and classification that we identify objects and feel the passing of time. Perception, beyond merely recording the raw data of sensory stimuli which is not perception at all, requires duration in time and even the backward referral in time. Synergies are chunks of action patterns and schemas that require a projection into the future shaped by experience obviously accumulated across the past. Synergies have anticipation built into them (the future) as also the integration of all ongoing experiences of movings (the past). The most fundamental work of synergies always lies in the interplay of the past and the future, all, of course, occurring in the fatness of the present. Synergies guide and manage an ongoing moving pattern (no matter how brief), yet as moving is never being in any place, it blossoms to include the past and future into a present that is never "here." They capture that important distinction between self-moving (virtual ongoingness) and movement (gridified event), in that they are both in the present and in the future and past, negotiating the action processes that, being virtual, are located in neither. Synergies are utterly dynamic and totally virtual; yet they are also comprised of banal biomechanical processes. As inseparable from self-moving they enact an aesthetic of impossibles.

Another essential characteristic of synergies is the necessary inclusion of information from the vestibular system. Earth beings live in an environment with a specific gravity. Our evolution as animate organisms has constructed our bodies so that moving demands constant negotiation related to Earth-specific gravity. This process involves not only the Earth-specific force of gravity, but also the

directional aspect of gravitational forces. Simple geometry allows us to appreciate the different synergistic demands of upright bipedal motility compared to quadrupedal motility. Balance, indeed, moving that is a fundamental aspect of posture, is much more complex and demanding for bipedal animals. For example, should as two-footed animals we need to stand for a length of time, we invariably feel the urge to walk or move around as well as to sit down. Moving facilitates balance and ease of feeling. Extensive adjustments in physiology occur throughout evolution to accommodate these bipedal needs. The structure of the human foot is an obvious example. The complexities of the vestibular system located in the inner ear contribute essentially to synergies.

The vestibular system is also fundamental to the persistent principle that the animate organism is designed to accomplish smooth movings. Let's return to that GoPro video example. When we are walking or running or riding a bike on rough jerky terrain, our visual image of our surroundings seems relatively smooth. This is because operative synergies adjust our eye movement, among many other neurological adjustments, to compensate for the jerk factor of the actual moving. You can easily confirm this synergy by simply sitting and looking across the room. Focus on the objects across the room and then, as you pan from one side to the other bob your head up and down as jerkily as comfortably possible. The objects remain relatively fixed in the horizontal plane. Our experience of them is much smoother than is our actual head movement. Here's another example. Focus on an object across the room. While continuing to think of that object, close your eyes and lift your head up a bit. Now open your eyes. You will likely still be focused on that object. These examples of common experience show both the remarkable ability of synergies to anticipate but also their support of the principle of retaining an experience of smooth movement. The reason the

GoPro[11] video seems jerky is that the "eye" of the camera is not part of a biomechanical synergy system. When we look at the video, because our bodies are not moving through the environment filmed, synergies that would make anticipatory and smoothing adjustments to balance and eye movement are not engaged. In a sense the video is the more objective experience.

What is the practical importance of synergies as well as our awareness of them? When we begin to appreciate how remarkably complicated is the coordination of various biological systems essential to performing the simplest most banal movings, we begin to appreciate that we do not need to consciously direct and coordinate all this complexity. Berthoz's book, *Simplexity: Simplifying Principles for a Complex World* (2009), focuses on the pervasiveness of schemas that allow us simplicity despite the actual incomprehensible complexity involved. Schemas are us! Synergies or schemas comprise our capacity to not only perform action but to anticipate future changes in variables to smoothly accomplish the task. Synergies are created and modified constantly in response to the ongoing actions (deeds) of the organism and the ongoing experience of the practice of the synergy. This means that what we do and how we do it impacts our abilities via the composition of synergies and our repertoire of synergies (strategies). Stated this way synergies seem so abstract and technical, yet it simply means that synergies are involved in the formation and performance of the gestures, postures, patterned movings, habits, skills, and lifeways that comprise our identities, culturally, historically, and individually. Synergies are remarkably plastic, adapting to and being constantly modified by their use and application, and stable and reliable, even occasionally annoyingly so.

The very existence of synergies is, as Berthoz argues, to simplify the daunting organic complexity of moving. The

[11] Anti-shake or image-stabilization mechanisms and Steadicams are frequently used with cameras to eliminate the objective jerk to imitate the synergies of human experience.

processes by which synergies are constructed and constantly refined are biologically given. The most fundamental qualities driving the shaping of synergies and schemas are smoothness and efficiency of moving. These are the same qualities operative at the primary level of proprioception. As the muscle spindles and Golgi Tendon Organs work in a dynamic relationship with one another they are designed to contribute to smooth efficient moving as the moving organism coordinates many systems and components encountering an everchanging environment. The kinesthetic dimension of proprioception, as also the system of schemas and synergies, is primarily one of sensing along the continua smooth/jerky, efficient/labored. I argue that these most fundamental kinesthetic sensations that rise in the awareness of the mover are those that correlate with the essential strategy of proprioceptors and synergies.

Taking Faust's, or rather Goethe's, statement seriously, "in the beginning is the deed," means that what we do, the way we move, the patterns of moving and action that we practice make us who we are. We are materially constructed in the sense that proprioceptors and synergies are biological (synapse and tissue), if also virtual (patterns and schemas), but not abstract or purely mental. Our synergies conjoin deed and ability, past and future, experience and imagination, identity and change, routine and innovation, muscle and nerves … all essential to our being who we are and want to become. We are biologically constructed with moving having primacy to coherency among the vastly complex systems that comprise the organism and the lucidity of the animate organism's ongoing encounters with the environment in which it exists. Values, both inherent to the organic system yet also felt and consciously acknowledgeable by human beings and applicable to all human experience, are constructed in terms of coherence/incoherence, smoothness/jerkiness, efficiency/inefficiency.

10

Kinesthesia

Much of our lives is spent seeking meaning, balance, and satisfaction, yet it is the threat to meaning, the feeling of imbalance, and the gnawing needs that drive us forward and urges us to be creative. Clearly when observed in others these incongruities are more interesting and less threatening, the stuff of gossip or empathy. Few enjoy those folks who seem to always have it together and are happily satisfied. They don't seem real. Signs of vulnerability are widely recognized as signs of authenticity and sincerity. The stories and entertainment we most enjoy and are inspired by are those with conflict and anguish and drama. We are inspired by those who have overcome failure, injury, and misfortune. We cry for those who suffer tragedy and loss. In the sense of drama as theater, the ancient Greek masks of comedy and tragedy characterize basic strategies or styles of engaging conflict and challenge. Our social relationships, the news sources we trust, our political perspective, and the values we live by are selected on their promise of coherence, fit, welcome. I've noticed recently happiness has become an industry. We evaluate and adjust our self-image—how we believe others see us—on how we imagine that it fits with those in the gang we choose to hang with. Our personal metrics, constantly monitored on our wrist computers and smart phones, offer continual readouts that we might interpret as "coherence factors" telling us whether and to what degree we fit the self-image we desire. We dress, drive, live, talk, date, eat, and socialize to fit in and we go to the

gym and take a host of fitness classes to reshape ourselves to be … well, fit.

The term coherence 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 and necessary copresence of this sticking together with ongoing hesitation, irresolution, and uncertainty as suggested by the deeper Latin root. It is in the persisting company of hesitancy and uncertainty that the desire for coherence motivates action. It is the feelings of hesitation, irresolution, and doubt that energizes action to gain coherence. In this sense, coherence shares something with moving, for it is always in the persisting possibility that it may cease and the unpredictability of future course that moving has its energy and its distinction; moving is always a force against the looming possibility of the inert and it always exists in the possibility of the unpredictable. As moving is living, the possibility of moving's cessation reminds of death, moving is *memento mori*. Life and death, inseparable.

Coherence too is not some condition, logically and factually describable. It is something we feel, a feeling kind of knowing that gives rise to agency and belief. Yet that power of conviction and action is based on the preference, contra the persistence of incoherence, for the feelings of coherence, fitting, congruence, rightness. Coherence is the vectored value driving a momentary hedge against chaos, the potential for coherence drives hope. Yet why do we humans, on the main, have this clear preference for order and fitness, especially when we are certain it is not based on some objective reasoned fact-based choice? Why do some people choose one thing in which to believe with conviction

as a strategy of coherence when their neighbors choose an opposing thing with the same commitment and feeling of certainty? Why are some folks inspired to creative action by the surprise of incongruity when others just trudge along?

Kinesthesia derives from Greek *cineo*, "to put in motion," and *aesthesis*, "sensation" or "impression," thus explicitly *the sensation of moving*. Kinesthesia, an aspect of proprioception, provides us the felt quality of our own self-movings in their ongoingness. I believe that these feelings, which might be described on a continuum from smoothness to jerkiness, certainly among other qualitative measures, constitute a fundamental source of experience that grounds our concepts of fitness, rightness, coherence, pleasure. As I pointed out, based on Alain Berthoz's neuroscience research on moving, the proprioceptors are designed to assure smooth and efficient moving and to avoid jerky unhealthy injurious painful moving. These are not values that we must choose, although certainly since they are associated with values correlating with pleasure and pain, with comfort and discomfort, with coherence and confusion, they constantly inform our self-moving, consciously, and not. Importantly, I argue, the sort of knowing we gain kinesthetically is a subjectively felt kind of knowing, that is, we know our moving as being smooth or jerky because we bodily experience it in these measures. This knowing is not propositional, hypothetical, or arguable because it is what we feel, experience, and thus know. It is akin to a toothache. What we describe as coherent, fit, right is felt to be obvious, just-so. We are not taught concepts of coherence or how to logically define coherence, that we might recognize it. It is rather the other way round. Concepts tend to be those ideas or principles that cohere and fit with reality as we experience it. Indeed, much of what argumentation seeks, when we engage it, is to support feelings of coherence. Ah yes, that makes sense, that fits! Now how can I explain my feelings that it all fits together? What is important is that all life-shaping behaviors are

described and motivated and given value and concreteness because they are based on concepts—a whole network of related concepts—that arise from and are grounded in our most fundamental bodied experiences, the feelings of our movings offered us by the sensory nature of moving itself, by the kinesthetic attributes of proprioception.

Coherence, rightness, and fitness are, I argue, concepts based in the common biology of proprioception/kinesthesia. The constant desire to fit in, to belong, to make sense seem universally human, understandably so given that it is biological. I would however look to proprioceptors for a clue as to how to understand more richly these common driving urges, values, and actions. Recall that proprioceptors not only seek smooth moving they also function to prevent jerkiness and injury. The muscle spindles are *excitatory* while the Golgi Tendon Organs are *inhibitory*. Following this quite profound biological model I suggest that we practice pairing coherence with incoherence, fitness with misfitness, smoothness with jerkiness. In doing so, we also honor the greater range of our kinesthetic feelings, and we appreciate that it is the dynamic copresence that fuels their energetics. We feel the importance of both smooth coherent moving and lurching jerky moving, and we realize that, as with proprioceptors, neither exists without the creative dynamics of the oppositional other, by the interplay of the two. As an aesthetic of impossibles, while we may seek smoothness, its appeal is limited to the copresence with jerkiness, at least its possibility. Or perhaps better, we experience vitality in the playfulness of the copresence of smoothness and jerkiness, coherence and incoherence. We relish drama because it always unfolds dynamically pitting good against evil, one side against another, either to comedic or tragic effect. Yet the total and final overcoming of one or the other is never a satisfying end. The wisdom of the proprioceptive moving body, transducing biology to philosophy, feeling to agency, is that we need, for our vitality, these creative and opposing tensions and the range of feelings that accompanies them.

Or alternately, we are comprised of these biologically based tensions. I'm not much of a supporter of the fitness adage "no pain, no gain," but it captures something of what I am suggesting. Yet, while the objective may appear to resolve the tension and opposition, the force and energy of vitality are generated in the ongoing dynamic. Resolution is a halt to moving and a ceasing of kinesthesia.

A core idea of the academic mandate, and I have been a lifelong academic in the humanities, is to find *meaning* in our subjects of study. In our studies we interpret and discern patterns and principles that we might understand them. We often frame this as "finding meaning." I've spent decades focused on this effort. Yet as I've come to appreciate the subjective corporeal conceptual nature of coherence/incoherence, smooth/jerky, I've realized that finding meaning is usually but a declaration of a false resolution to the dynamic that initially attracted us. It is often our own creation of meaning in the form of an argument to justify resolution, coherence, explanation. This strategy tends to halt the very dynamic condition that spurs our passion for our subject. If we appreciate the wisdom of proprioception/kinesthesia, we surely will realize that it is both more interesting and valuable to consider the energizing dynamics of tensional forces than it is to halt these dynamics falsely or prematurely by concocting something we call meaning or explanation. This is not a concern limited to academics, since human life is shaped by the drama inherent in living. As I've argued, vitality, the verve of life, is inseparable from self-moving. The corollary is that attending to healthy self-moving is at least one important strategy for experiencing this vigor. To me ongoing vigor trumps the halt of meaning. For academics, as well as life in general, rather than inventing resolution, interpretation, conclusion, explanation, or meaning, we should explore and offer accounts of and hypothetic inferences for the dynamic processes, ongoing relationships, tensional forces, irresol-

vable copresences—or what I am referring to as the aesthetic of impossibles.

In the world we live in today, one of the most confounding issues with which I struggle daily is the existence of profoundly different understandings of the world. It is widely held that we live in a time of much division with many people staunchly holding and harshly defending their values and perspectives. At a rather banal level this is what I've long understood in folksy terms as the home or home team problem. We experience this feeling when we travel from our homeland, which we dearly love and think beautiful, to another location finding it ugly and uninviting. "Who could live in this God-forsaken place?" we ask. Yet, we often meet folks who live in these places who truly love it and think it beautiful. The same is true for our near certainty to "root, root, root for the home team," even if we live in this place only because of a job transfer. Even if the home team rarely wins. Yet, more seriously, politics and religion tend to foster beliefs so strongly held as to exclude, even prohibit, any other views. Exclusivity is often a factor in these beliefs. Seemingly, no amount of discussion or argument, no set of cited facts, will change anyone. Likely there is a correlation between the closeness and exclusiveness with which we hold to our beliefs and the extent of threat to them we feel. In my struggles with this problem, I have valued understanding that what feels just-so, obvious, unquestionable is based in the bodied experience of smooth/jerky movings. We hold the positions that cohere to us because of a feeling bodied moving-based kind of knowing. Occasionally we find ourselves denying what otherwise we'd acknowledge as objectively factual, because it simply does not feel coherent, it does not feel right. While we must, I think, agree that facts generally are facts, I think it helpful to appreciate the power of kinesthetically based feelings associated with coherence and to know that these feelings, grounded in biology, are shaped by our life experience acquired in specific historical, cultural, gendered,

religious, political settings. Hopefully this moving body-based wisdom might encourage a measure of tolerance and empathy. Yet, I doubt if it will keep us from having ill thoughts about those who do not concur that the world is as we find it just-so.

11

Skill

As my appreciation of the primacy of self-moving has grown, I've found myself more and more convinced that the efforts we make to live full healthful lives might well be characterized as acquiring and mastering the *skill of creating and being me*. I see life as comprised of highly repeated patterns of moving practiced and developed over the years we live. Skill demonstrates our human capacity for choice and agency.

It may seem a bit shocking to consider that our identity, who we are and what distinguishes us among others, is based on the practice of a skill. We often think of ego, personality, physical appearance, character, visage, age, gender. Yet, it is quite common for certain high skill activities—music, dancing, sports, job—to be used as the way some identify themselves. I am a dancer. I am a skier. But we also identify with occupations that require skill. I am a fashion designer. I am a computer programmer. I am a writer. I am a teacher. As I have argued Faust's statement, "in the beginning was the deed," we commonly identify ourselves by the deeds we do, the work we do, the skills we have developed. We do so because performing these deeds, practicing these skills, are important to how we create and discover ourselves. I suggest that as we identify ourselves with all our deeds, our movings, we should be aware that these deeds and moving are skills. While a person is a teacher or a dancer during certain hours of the day and days of the week, we all know that to identify oneself as teacher or dancer shapes reflects all of life in some ways, not just specific hours or actions. We often make statements like, "I

look at the world as a teacher." Yet we might also say, "I approach my teaching, and everything else, because I am Alice." If we consider our identities as based in skilled movings comprised of synergies, strategies, gestures, postures, and agentive actions, could we not practice being ourselves in the effort to hone our skill, with repetition and critical evaluation, and improve ourselves as simply an aspect of being who we are and want to be in the lifelong effort to achieve our fullest potential?

I recall a few years ago reading that a large portion of our lives is lived on a highly predictable schedule, suggesting that we are creatures of habit. Priding myself as being a creative person thinking myself often subject to caprice I scoffed at the idea. To assure my supposed spirited serendipitous lifestyle, I decided to track myself, hour by hour, day by day. I was shocked by the results. Sure enough, I'd be finishing a shower at the gym right after taking a step aerobics class every Wednesday sitting down to tie my shoes within a minute of a predictable schedule. And the same ladies would be in my class demanding their "spot" and the same guys would be in the locker room. I arrived at my classes at the university at precisely the same times. I drove the same routes, walked the same paths, ate the same foods on the same days, arose and went to bed close to the same times.

At first, I was pretty disgusted at my own predictability, thinking myself not nearly so creative and impulsively free as I had imagined. Perhaps I was just a boring dull person, a robot marching in step with all the other robots. One of the Cybermen in "Doctor Who," a television show I also watched with my granddaughter every Wednesday evening. In time, as my reflections on moving continued, I began to imagine a different and potentially more positive understanding. It took my contemplation of the distinction and an overlap of thinking about gesture and skill.

Rather than think of this patterning negatively, creatures of (bad?) habits, I began to consider if we might

think of our lives as comprised of gestures, patterns of self-movings some consciously learned and some not, and to see these gestures as synergies formed to enact our moving lives smoothly and efficiently. Skills are comprised of gestures (synergies and schemas) that can be directed toward continual development. At the point we gain skill even close to mastery we begin to enjoy confidence and ease. In terms of our personal development why not consider all our routine actions as the development and performance of skill? This approach would offer us a perspective that encourages agency rather than passivity. Should we desire change, we might approach it as developing new skills recognizing that this process takes time, repetition, and critical evaluation. In terms of our encounter and interaction with others, might we not appreciate others more fully if we consider their identity, their way of being in the world, a skill complex formed by their repeated practices of the way they have discovered and made themselves in the context of their history, culture, and personal distinctions? Rather than feeling threatened by differences, we might appreciate them because they are based on skilled actions.

I once invited a friend from India who was master of tabla (traditional North Indian drums) to come to America to make a music album with a kora (a plucked 21-stringed gourd resonator instrument) player from Senegal. I understood the learning and performance of tabla drumming in North India followed strict rules and forbade improvisation. I asked my friend how he felt comfortable engaging in a musical improvisational duo so far afield from North Indian traditions. He told me that according to his mentors once one has mastered the drums, he is somewhat free from these strict rules. I discovered the same thing related to flamenco guitar. Paco de Lucia came to master the guitar to such a level that he felt free to improvise and innovate, if sometimes receiving criticism from flamenco strict traditionalists. I found the same notions associated

with bharata natyam, the South Indian classical dance. And so too, perhaps, with ballet expanding from classical to modern ballet. I had the pleasure of going to Preservation Hall in New Orleans years ago to sit on a hard bench in that tiny, crowded room to listen to the Preservation Hall Jazz Band. The piano player at the time, Emma, seemed to have had a stroke and one arm and hand didn't work. Seemingly ancient, as also were several of the other musicians, she had a bag of soda crackers stashed within reach. When she played it was utter magic. The constant improvisations among this group were the sort of magnificence won only by decades of ensemble playing.

Freedom then, I began to understand, isn't the impulsive actions of the novice; it is the reward of the mastery of skill earned by long disciplined practice. I think we so often get this relationship reversed.

As I have increasingly appreciated human movings, as I began to comprehend that synaptic criteria are shaped by repeated behavior, as I learned the existence of synergies formed by high repetition of deeds, as I found that the proprioceptors that permeate our muscles and joints are honed to precise operation by repeated movings … appreciating all these things and more about self-moving, I began to contemplate that human life is comprised of a complex of gestures and skills that together operate organically to make and enact our individual identities, our very being. Identity is not some innate fixed essence we are born with or develop early in life; it is a lifelong practice of honing and exercising the skill of becoming and being me. The greater the level of skill the greater potential for freedom and confidence and ease.

There is a difference between simply repeating an action over and over and building skill. I suggest that gesture is a good term for patterned moving behaviors that form based on most any repetition, especially those drawn ordinarily unconsciously from cultural and social interactions. I consider the importance of gesture in another

essay. Quotidian life involves repetitive gestural movings that are often not the subject of the concentrated critical attention necessary for skill development. Let me consider, an interlude, this perhaps pseudo-skill behavior in terms of experience.

Experience has close connections with moving in that, in one usage, it denotes bodily active presence. We equate doing with experiencing, and, of course, doing is always moving. It is a sense of the quality and presence of ongoing action and behavior. The word experience is also used to designate the distinction, the extraordinariness, of something we do or have done. This usage is often combined with an adjective. That trip was a horrible (amazing) experience. We also use the word to indicate an accumulation of action over time that results from repetition of patterned behavior. In a job interview we are often asked about our experience. We acknowledge someone who has experience in a task or a kind of situation. Experience, in this cumulative aspect, is something of an amorphous cluster of interconnections that adds freedom and richness and confidence and agility in further encounters in the area of experience. In this sense, experience is akin to skill. Experience is commonly the core factor that distinguishes mentor and apprentice. Physicians, teachers, elders have experience in this cumulative sense. Cumulative experience is possible in part due to the neurological compositing of the repetitions, including all the accompanying implications, of movings.[12] In acknowledging that we learn from our mistakes, isn't this an indication that we make changes to

[12] The research of neuroscientist Michael Merzenich concluded that "the specific details of cortical 'representations'—of the distributed, selective responses of cortical neurons—are established and are continually remodeled by our experiences throughout life." (Quoted in Thelen and Smith, 138). The neurological component that accounts for pattern formation, synergies, accumulated experience seems strongly supported by the proposed ensembling capacities of the brain as described by Nobelist Gerald M. Edelman, *Second Nature: Brain Science and Human Knowledge* (2006).

our skill sets to improve performance outcome? Might we not consider quotidian cumulative experience as "skill lite." As we grope our way through life we gain acumen, insight, skill and we often simply call it experience.

Skill is consciously built by the desire and attention to refine acuity and strive for mastery. These efforts usually require criticism, either by others (think of the ballet master or coach or mentor or teacher or model) or by one's own careful and attentive efforts and aspirations. Mirrors of all kinds. In building skill, repetition becomes practice, and the process is usually a long one. I think Malcolm Gladwell is credited with popularizing the idea that it takes ten thousand hours to master a skill. Perhaps at best a rule of thumb, but for me its importance is in communicating that we don't achieve mastery quickly. I have applied the rule to my granddaughter, Fatu, who has been a dancer for more than a dozen years. At twenty hours a week, which is a fairly accurate estimate of her dancing, mastery should take 500 weeks or around ten years. Clearly when I see her dancing in L.A. now, I appreciate her earned mastery, indeed, I'm thrilled by it.

Do we dare think of life as a skill in anything like the way we think of music or dancing or a sport? Why not? The distinction is, I believe, first, being aware that even our most banal patterns of moving can be honed and improved and developed, and then, understanding that we can be attentive to the quality and acuity of the performance of even these most quotidian movings. Not a fan of the Cartesian separation of mind and body, I often resist the promotion of what many term mindfulness. I resist the implication that mind is apart from body, distinct from the animate organism. I resist that mind is the controller of the body. I find laughable those who say, "oh my brain made me do it." My thoughts, "Oh does your brain have a mind of its own?" Mindfulness is often paired with emphasis on limitations of moving. I'm no sitting meditator. I'm sure this admission will rouse lots of huffing and puffing from some, perhaps

deservedly so. Those gesturally naturalized to sitting meditation tell me that my impatience with sitting is the best evidence of why I must do it. However, I think skill is gained only by being *attentive to* the qualities and characteristics of our moving behaviors with the intent to improve them, increase our mastery, hone the synergies that allow the performances of our movings so that they feel natural, smooth, easy, effortless as they should in healthy and vital living. Yes, I'm aware that my meditation friends approach their skill in precisely these terms. This being attentive to, may qualify as being mindful, yet I suggestion that as animate organisms, as movers, we strive for the identity, as well as the distinction, of action and awareness, the ingredients of "flow" according to Mihaly Csikszentmihalyi. A practice of an aesthetic of impossibles.

As I have aged, I have often contemplated why aging is often assumed to correlate with the loss of skill in moving. We live in a remarkably ageist society, yet there are exceptions. There are those old folks in the Preservation Hall Jazz Band; the one-handed piano playing of Emma. Bob Dylan is past 80 as are so many other great musicians. The Rolling Stones tour named "Sixty" commemorates the number of years they have been a band. Paul McCartney tours at age 80. I remember years ago attending a funeral on a beach in Ghana. It included dancing. First were the amazingly athletic powerful young dancers. But later a group of elderly women entered the dance ground. I was blown away by their dancing. It seemed to me analogous to a fine reduction sauce or perhaps an aged wine. They were not wildly athletic, yet their moving captured the essence of Ghana itself, at least as I imagined it, and dignity and wisdom and beauty and femininity and elegance and age. Still, I acknowledge that for me there are few things that rival my utter enthrallment when I see the explosive exuberance of the movings of young people. Several years ago, I became frustrated that so many of my age peers, indeed some that are decades younger than me, tend to be

self-ageist by constantly declaring some behavior, a moment of forgetfulness or clumsiness, a "senior moment." I don't quite understand whether this is excuse or simply gesturally naturalized humor among age peers. Considering the use of that term at best a self-fulfilling prophecy and at worst an excuse for giving up and losing interest in life, I thought it might be nice to rehabilitate this phrase, so it has a positive association. Should we choose to consider living life as acquiring skill through engaged practice (sometimes we think of in general terms as wisdom and experience), shouldn't we expect that the rewards of a long life to be positive? I thought it would be fun if, when a chronologically advanced person performs a social or physical act with grace and insight based on decades of practice—settling a family conflict, comforting a stressed grandchild, peacefully negotiating a political argument at the Thanksgiving table—she or he would pause, reflect, and declare quietly and privately this skilled action to have been a senior moment.

Understanding background feelings of coherence/ incoherence and the feelings we understand to be emotions are inseparable from biomechanics, from our self-moving bodies, encourages us to practice skillful moving that over time we might manage refinements in feelings and emotions and even our patterns of thinking.

I suggest that we consider our identity, our individual lives, as a composite of gestures and skills that involve all sorts of patterned and repeated movings. As a nexus of skills, we are encouraged to be attentive to the way we prform the most ordinary activities in our lives: eating, working, walking, sitting, sleeping, recreating, socializing, and common maintenance activities. Each of these, we might discover, is a possible subject of our attention and our practice to improve. I also strongly advocate that to engage seriously and persistently over considerable time in at least one skill beyond those of the ordinary process of living—music, sport, anything that accumulates toward the

ten thousand hours. Being significantly skilled at something is essential, I believe, not only for achieving one's full potential but also for understanding the freedom that comes with mastery. Gaining the experience of being skilled at something pervades our lives. We live in a society that demands instant gratitude, the sort of expectation that discourages us from the long repetitive attentive effort to achieve mastery. Yet, unless we make the sustained effort, we simply cannot experience the quality of mastery and the freedom it affords. We might imagine that rather than repetitive patterned behavior being boring or habit (perhaps bad ones that can't be easily abandoned), monitored practice is how we might master the skills key to experiencing freedom and the fullness of life.

12

Brain

In his 2006 book *Second Nature: Brain Science and Human Knowledge*, Nobel Laureate neuroscientist Gerald M. Edelman's initial concern is establishing a neurological basis for consciousness. His theory of consciousness makes a distinction between primary consciousness, held by all or most animals, and what he terms a particularly human high-order consciousness that is distinguished by "being conscious of being conscious accompanied by concepts of the past, the future, and the namable self" (15). While I don't need to see human consciousness as necessarily higher, different is good enough for me, it is inarguably more complicated and, as Edelman contends, requires a larger and more complex brain. I further do not find a brain-only understanding of consciousness adequate given that I can't imagine how consciousness can involve anything less than the whole animate organism. Even if brain-centered one must be conscious of something and that requires presence of more than the brain. Edelman concurs yet concentrates his attention on the brain. Without doubt the brain plays an essential and remarkably complicated part in life. And it is negligent to contemplate human distinctiveness without considering our brains. A modestly detailed description of brain functioning complements the outline description of proprioceptors. My persistent argument for the distinctively human aesthetic of impossibles is compatible with Edelman's understanding of human consciousness. An aesthetic of impossibles requires the copresence of the distance involved in a consciousness of being conscious that is also a felt presence, that is, the

felt identity with a namable self. The *consciousness of* still has presence, yet it also has *distance* from the same presence as having consciousness as its own object. In this virtual gap is the aesthetic of impossibles and the birth of philosophy. An aesthetic of impossibles requires the copresence of two things at once—as required of all comparison and thus of concepts, patterns, categories—considered as identical in some respects and as also not the same at all—a logical impossibility.

In insisting that brains are not calculators or computers, countering a popular assumption, Edelman's position is that the brain is largely concerned with pattern recognition or coherence. His task is to describe the organ in a way that "accounts for coherent brain action in the absence of computation" (24), building to the conclusion that "being selectional systems, brains operate prima facie not by logic but rather by pattern recognition. This process is *not* precise, as is logic and mathematics. Instead, it trades off specificity and precision, if necessary, to increase its range" (58). In other words, consistent with the neuromuscular proprioception/kinesthesia system, the brain, which is the center of the neurological side of proprioception, is an organ that also functions, according to Edelman, by the inexact process of evaluating coherence with the obvious copresence of incoherence.

In describing Edelman's neuroscience, it is important to recognize that he locates the brain in the body and the body in the environment. This contextualization of the brain anticipates my later discussions of gesture, posture, and prosthesis, but it also attempts to dispel, yet ironically confirms as so often happens, the Cartesian proposition that the mind/brain is central, and the body is but mere support or vehicle. Edelman states, "The brain is embodied and the body in embedded. … The brain's maps and connections are altered not only by what you sense but by *how you move*" (24, my italics). Edelman notes that the brain is his "favorite organ" while acknowledging "you *are* your

body" (24). As gesturally naturalized as we are to the hierarchical distinction of mind (brain) above body, and even to the distinction of the brain and body (the implied separation an impossible I gleefully note), my persistent emphasis is to attempt to re-naturalize our wholeness as animate organisms. Still, it is valuable to understand in a general way how the brain works to appreciate its contribution to the complex animate organism. Perhaps I should offer the caveat that I select Edelman's understanding knowing full well it is one among many and I do so because it supports my own agenda. Still Edelman is a Nobelist so his science can't be considered fringe or easily dismissed.

Among the most remarkable insights into brain functions, to me, is plasticity, the brain's capacity to be molded and changed. The obvious importance is that brain plasticity has limited interest if the brain is considered as primary or as isolated from the rest of the body. But then brain plasticity seems utterly obvious and banal when you think about memory, knowledge, accumulated experience, skill, gesture, autonomic functions, none of which could occur without changes in the brain that have a certain endurance. Along with Joseph LeDoux's 2002 book *The Synaptic Self: How Our Brains Become Who We Are* (esp. 301-24), Edelman focuses on the synapse to account for how the brain accommodates change. LeDoux refers to synaptic criteria, that is, what sorts of conditions must exist for the release of the neurotransmitters that bridge the synaptic gap to effect the synapse. What is most significant for my concerns is that these criteria are shaped by deeds, by the moving, gesturing, acting body, yet they also are operative in the performance of all these deeds. As Edelman puts it "various activities and biochemical events can change their [synapses] strength. These changes can determine which neuronal pathways are selected. Patterns of changes in synaptic strength provide a basis for memory" (19). As events, deeds, actions are experienced by the organism,

many parts of the brain are simultaneously engaged in the process of change and accommodation. Many neuroscientists have demonstrated that the brain has the means of communication within itself, internuncial networking, what Edelman refers to as *reentrance*, so that these various changes are roughly coordinated. The catch phrase so commonly invoked, "neurons that fire together wire together," makes the point even though I think the wiring analogy is remarkably misleading, even suggesting contrary evidence to Edelman's mission to show that the brain is not a computer. Edelman seeks to recover by holding "There is no logic and no precise clock [both essential to a computing machine] governing the outputs of our brains no matter how regular they may appear" (21).

Offering an alternative to the computer analogy of the brain, Edelman outlines what he refers to as Neural Darwinism. I have found it important and insightful to place what I understand as attributes of human distinctiveness as resulting from the thousands of generations of adaptation as needed for survival. Edelman, following Charles Darwin, notes that this process of evolution requires a generator of diversity, a challenge from the environment that gives rise to competition, and differential adaptations among some variants that are fitter than others resulting in greater survival. The coherence/incoherence dynamic is fundamental to the process of evolution. Among the competing varying strategies for overcoming ongoing threats, those that lead to the fittest become the ones selected to survive. Survival and the associated changes correlate with coherence. Edelman reframes the long time span common to species evolution suggesting that adaptations in the brain occur over the lifetime of the individual, thus Neural Darwinism. Yet, of course the human brain evolves over the long durée as well. The brain designed to continually select connections to create neuronal circuits produces vast variation in synaptic criteria. Signals received by the brain connected with experience and

action result in experiential selections that strengthen some synapses and weakens others; that is, synaptic criteria are sensitive to the behavior of the whole organism. The result is the development of signal pathways and neuronal groupings. Edelman asks how, without the logic and clock synchronization fundamental to a computer, "do we get *coherent* behavior out of the system?" (28, Edelman's emphasis). His solution is *reentry* "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. … A net effect of this reentrant traffic is the time-locked or synchronized firing of neuronal groups in particular circuits" (29-30). Selection among vast possibilities of specific synaptic connections in response to the challenge presented by behavior and action of the whole organism forms circuits and groups of neurons—we could call them synergies, skills, memories, concepts, motor programs, feelings, emotions, knowledge, etc.—whose coherence is due to the reentrance communication within and throughout the brain.[13] While these circuits and groups are created and continually shaped by exigencies of efferent signals—that is they are plastic to the extent the organism needs—they also serve to enable and drive the behavior and functions of the organism, both as autonomically required and as called for by agency. Edelman also notes that this process of selection linked to coherence does not result in but singular neuronal programs but simultaneously involves the creation of many alternative circuits and neuronal groups that might meet the same needs and functions. Rather than these alternatives being identical and redundant, they are what Edelman refers to as *degenerate* in which "different structures can yield the same output or consequences" (33).

[13] Gerald Edelman's term "neuronal groups" is similar to Berkeley neuroscientist Walter J. Freeman's "nerve cell assemblies" and Thelen's and Smith's "ensembles."

Edelman's words nicely summarize. "A selectional theory such as Neural Darwinism necessarily posits enormously diverse repertoires of neuronal groups. It explains how combinations of such groups can be bound into integrated wholes depending on diverse inputs from the body, the world, and the brain itself. … these are just the properties needed to account for the enormously rich yet unitary properties of the conscious state" (34).

In focusing human distinctiveness on moving, human self-moving, it is remarkable that in the biological, evolutionary, and philosophical consideration of essential component systems—proprioception, kinesthesia, brain—a foundational principle is the copresence of coherence and incoherence, a dynamic that is moving itself rather than logic, reason, calculation, representation. To me, the implications of self-moving and the persistent operator of coherence/incoherence amount to a creative and insightful reframing of the way we understand and appreciate human distinctiveness and all its behaviors and implications. Emphasis rests on experience, deed, corporeality of concepts, the centrality of the self-moving body, skill, gesture, posture, feeling in our appreciation of human perception, memory, time, knowing, value, belief. Strongly put the coordination and experienced coherence of the complex animate organism is driven and achieved by the ever-present demands of the ongoingness of self-moving.

13

Twinkling Metastable Regime

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

> 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 Kelso

> 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 Packard

Neuroscientist J. A. Scott Kelso's work develops on the classic work of Nobel laureate and neuroscientist Sir Charles Scott Sherrington (1857-1952). In the late nineteenth century studying muscle systems Sherrington developed what has come to be known as Sherrington's Law, for which he and Edgar Adrian were awarded the Nobel Prize in 1932. 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 in 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. Sherrington held up reflexes as the simplest expressions of the interactive action of the nervous system (Sherrington, 1906). In this tradition, Kelso describes a "twinkling metastable regime" (Sherrington's phrase) 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" (quoting Kelso 1995, in Sheets-Johnstone, 484). This tendency to at once "bind together and to maintain independence" is what I have been referring to as an aesthetic of impossibles and I concur with Kelso who held that this tendency occurs everywhere from neurons to many other aspects of living creatures. The neuroscientific research trajectory from Sherrington to Kelso is the development of a broadly applicable study of *coordination dynamics* or *dynamic systems*.

The fundamental concern is the analysis of how complex systems gain and maintain coherence. What is the force or mechanism that is operative in any complex system from neuronal to social systems? Philosopher Maxine Sheets-Johnstone poses a powerful proposition in her *Primacy of Movement*, writing, "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.' [quoting Sherrington 1953, 180]" (484). The coherence of a functioning system is at one with the force the ongoingness of moving. System dynamics is, at heart, a biology and a philosophy of moving.

For years I taught a form of salsa dancing, *reuda de casino*. It is done with partners yet all the pairs dance together in a circle. I regularly taught in high schools with

groups that had uneven numbers of boys and girls, so everyone learned to lead and follow and dance with everyone else without regard to gender. The kids were all over the scale of ability and dance experience. Everyone had to do the same move at the same time—the named moves are called—and on the correct beat in the music and the moves often include changing partners and moving among partners around the circle. I never took anyone aside for individual instruction. I never divided the group in terms of ability. I relied only on the demands of the constantly moving circle. I understood that keeping with the music and everyone moving together, both being essential to a coherent *rueda*, would require everyone to adjust and assist everyone else while moving. The *rueda* was a living complex system comprised of many variables yet, as Sherrington indicated long ago, the ongoingness of the moving was itself "the cause of the harmony of its parts." There are a great many banal examples we experience every day like how dozens of people can walk in differing directions on a crowded sidewalk and never run into one another. The danger comes if someone stops.

It is common and popular to pinpoint areas with specific functions in the brain, indeed, it is an accepted view by many folks as well as a few neuroscientists that the brain is the commander. Yet, others have held that the isolation of the brain in the skull—in fictional brain in a vat—as misleading at best. The limitations of these assumptions have also been described in *Brainwashed: The Seductive Appeal of Mindless Neuroscience* (2013) by Sally Satel and Scott O. Lilienfeld as well as by Alva Noë's *Out of Our Heads: Why You Are Not Your Brain, and Other Lessons from the Biology of Consciousness* (2010). I feel that the wiring analogy so often applied to neurological functions seduces us into an over-simplified and falsely linear expectation. Kelso reframes the concern by clarifying what is evident, if only acknowledged, in PET scans (positron emission tomography) and fMRI (functional magnetic resonance imaging) images 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" (Sheets-Johnstone, 484, quoting Kelso 1995: 27). Nonlinearity highlights a relationship among variables that does not always move in perfect lockstep. Kelso notes that these scans and images reveal that activity is distributed throughout the brain and, of course, throughout the organism. The moving is reticulated, not linear. Kelso's and David A. Engstrøm's work *The Complementary Nature* (2008) in coordination dynamics is consistent with the account of the brain I have already sketched based heavily on Gerald Edelman's work. This understanding holds that it is by means of amazingly complex systems that communicate in nonlinear metastable networks spread throughout the brain—including reentrant activity directed toward the brain functioning itself and similar processes found throughout the entire organism—that offer sufficient coordination among the composite of parts to function as coherent beings. Perhaps of even greater importance than identifying some area in the brain that can be attributed as the seat and cause of some specific action, apart from the extensive medical value, is the fuller realization of how reticulated and internally interconnected the brain is, as is also the nervous system and the entire organism and its interconnection with the environment. Put simply, the coordination occurs to maintain ongoingness, moving.

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 singularly 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 a particular brain from conception

to a 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 subtractive scans of 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" (Steven Rose, *The Future of the Brain* 2005, 219-20, quoted in Sheets-Johnstone, 493). 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 argument and isn't that what is of fundamental importance?

The most problematic line of presentation, commonly heard, is to present "the brain" as the initiator and controller of all action and behavior and thought, as evident in 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. 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 influences 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." Perhaps the best known of scientists who hold this view is Nobel Prize winning co-discoverer of DNA, Francis Crick, who wrote in his 1995 book *The Astonishing Hypothesis: The Scientific Search for the Soul* "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." Of course, this statement can be interpreted and accepted as stating nothing more than that we are biological beings. However, it may also be read in a reductionist way seemingly denying what we experience as the wholeness of self. Such an interpretation would require us to consider our brain as controlled by something like a conscious homunculus that is separate from us, from who we are. That there is an inner master independent from what we identify as "me." Were we to somehow buy this proposition, would we not be in the same place regarding this brain-self? Does it have free will? What is behind the decisions it makes for us?

I think there is widespread misdirection about the colorful results of many fMRI findings that show us specific brain locations, all colorfully lighted up, and indicate that we now know the source (area of the brain) of certain actions or behaviors, implying that these little locations establish the director and controller role, the independent agency, of the brain. Despite the illogicality and impossibility of these implications, I believe that the general architecture of brains, their basic design, reveals much that is inspiring and important. 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 refer 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 or control functions. I don't discredit either because I certainly think we learn much either way. Yet, what I have in mind is perhaps a bit more aesthetically directed and focuses more on basic architecture of the most foundational brain components: neurons and synapses. I delightedly find that neuron/synapse architecture corresponds with the principles of the copresent implications I have introduced in

terms of self-moving and with the basic architecture of many other constituents of the animate organism.

Coordination dynamics, as a field of study, reveals much. It presumes the subject is a complex dynamic system that somehow is coordinated to the degree that it functions somewhat coherently. It acknowledges that many of the parts and functions of the whole organism act simultaneously in opposition with one another, that is, these systems are metastable or capable of the copresence of oppositions; indeed, that this metastability is an essential capacity of these systems. Coordination dynamics also acknowledges the unpredictability of the system, that no rule or formulation is ever fully adequate. Complex systems are to an extent nonlinear. This, to me, is the key to the novelty and creativity possible in such systems. And finally, coordination dynamics helps us realize and appreciate that, despite metastability and nonlinearity, indeed by showing the essential role of both, it is the force of ongoing moving that accounts for the harmony of its parts.

14

Coenesthesia

Coenesthesia says I by itself.
Michel Serres

Here is the story of the personal background to my asking the question, "what do we recognize as so powerful that, despite even its acknowledged irrationality and its absence of support by facts, it turns an option or a possibility into a belief or conviction, accompanied by actions and practices sometimes threatening self and others?" This question is relevant to many religious and political beliefs. My mentors at the University of Chicago were two renowned religion scholars, Mircea Eliade (1907-1986) and Jonathan Z. Smith (1937-2017). They differed on much. Based on studying their works for fifty years I believe that all their differences might be framed by how they valued difference. Eliade was a grand patternist on the order of anthropologists James George Frazer (1854-1941) and Edward B. Tylor (1832-1917) in the late nineteenth and early twentieth centuries. These scholars sought commonality among all the diverse cultures and religions across the globe, reducing this whole chaotic mess to some common themes and symbols and patterns these scholars invented. For them difference, incongruity, and diversity were confronted as enemies, interesting to be sure, to be slain. At some level, they held, religions and cultures are all more or less the same despite appearances. Eliade's penchant for order extended to his theory of religion—perhaps better identified as academic theology—which held that all order came into being in the makings and shapings done by the gods in their creative

acts. These acts performed in mythic times in the beginning created the foundational principles, the very axis about which the world turns, metaphorically speaking and often symbolically represented. Humans in being religious model their lives and works on the patterns laid down by the gods and any variation is unwanted and unacceptable (sinful?). Of course, this meant Eliade was no fan of history or really even human creativity.

Jonathan Z. Smith openly opposed his colleague by asserting that difference, incongruity, even chaos were far more interesting and important than all this sameness and order. He noted how much Eliade, and his ilk, had to bend their cultural examples to fit their invented patterns. Charting the course of history is, he reminded us, telling the stories of conflict, war, strife, suffering, insurmountable issues. He reasoned that differences among people and cultures and religions were important even in simply acknowledging and honoring specific identities. Yet attending to difference raises the questions of what, if anything, all these different folks share. And it also raises the questions of category and classification and comparison. What is culture? What is religion? What is history? What is human? How can we address these questions while still treasuring differences? Invariably some sense of sameness must be introduced.

My academic career has been shaped by struggling with the opposing tensional poles forcefully argued by my academic fathers. How to honor them without patricide? Eliade clearly has been the more popular and is still read widely outside the confines of the discourse among academic specialists. Smith is credited by this academic community with defeating Eliade, yet I suspect that many who acknowledged Smith's development continued to tacitly prefer Eliade. I ask, why was Eliade's grand tale that found sameness in all difference so popular and remains so? Why did so many find Smith jarring and contentious and controversial? Since my work more closely followed

Smith's, I have often been the subject of controversy and angry response. Why?

In broad terms I've asked why difference so often seems threatening and offensive. Negative responses to difference underlie racism, sexism, agism, religious discrimination and so many other arenas where difference seems threatening, leading to arguments, insults, war, discrimination, even genocide. Seems we humans strongly prefer sameness and feel threatened by difference. I wrote a book about this issue called *Creative Encounters, Appreciating Difference* (2019). The question is, what makes folks so utterly devoted to their own identity factors that they are commonly willing to argue, insult, fight, and die to defend them? There is currently a scarcity of tolerance and empathy and an emboldened nastiness engaged in defending oneself and one's cohort against the threat of those who are different. My study of what distinguishes humankind, my discovery of these feelings and behaviors taking up too much real estate in myself, have urged me to try to understand this part of human nature.

Difference occupies many spaces and shapes. I, of course, welcome difference. It is at the core of metastability and nonlinearity. Difference is necessary for creativity. Difference makes encounters interesting and consequential. Appreciating difference enriches. A common way of appreciating difference is the fascination with the unusual or the exotic. What seems exotic to me is really just another folk's ordinary way of living. We are fascinated with the exotic difference, if kept at a proper distance: a cultural tour or *National Geographic Magazine*. But then there are those differences that are for me much more troubling. How can one folk have members who hate and abuse and kill the folks that are different from them? Why do people willingly give up their own lives or kill other folks simply because of differences in skin color, in gender, in ethnicity, in language, in age (just to begin a very long list)? How can one political party think it is fine to kill people in the name of the state

while professing their love of Jesus? I must conclude that such differences cannot be based on reason; few arguments are ever won or minds changed based on reason or facts. This seeming rigidity must be based on some felt sense of rightness, of the unquestionable, of the just-so. If reason served as the universal arbiter of difference, if facts were accepted as facts by all (and that's what the word means isn't it?), we'd just get some really smart logicians together and they would resolve all the differences and we'd all live happily, if also perhaps a bit bored, ever after. But reason isn't the way we work. This insight forces the question of what is there about being human that urges us toward convictions, beliefs, actions not founded on reason and fact?

There is a related question. When we are confronted with a problem or situation that has many possible solutions, what grounds our decision to pursue one possibility rather than any of the others? This question is relevant to all scientific and creative work. Put technically, how does hypothetic inference work? Put familiarly, what confirms and drives the conviction of our beliefs and creativity? In folk terms why do we make the choices we do?

I suggest the key to comprehending both questions is that our beliefs and convictions, our best guesses and most promising hypotheses, are rooted in our feelings of fitness on a continuum from incoherence to coherence. These words imply an assessment of fitness, congruence, sameness, compatibility, rightness, yet such assessments are felt, a feeling kind of knowing, rather than based on reason or fact. Indeed, in a sense reason and fact serve to support feelings rather than the other way round. A good portion of our thinking and acting is based on what feels right or just-so. Reason and facts become relevant to assist in justifying or explaining ourselves to those who disagree or threaten us or who we wish to influence. More publicly and formally, reason and fact serve to test hypotheses, but not so much

in coming up with them. Reason and fact are properties of induction and deduction, but not so much abduction, to use Charles Sanders Peirce's term for hypothetic inference.

This explanation feels right, doesn't it? Now can I just accept differences among folks and stop calling by nasty names those with whom I don't agree? Likely not, but I can try. I might be able to feel slightly guilty when I misbehave. Now perhaps I can put the experience of incongruity identified as *surprise* to work to help me settle on a hypothesis, or to be creative.[14] But then I'm left seeking an understanding of this seemingly mysterious power within human beings that gives us such confidence and conviction regarding feelings of coherence/incoherence. It can (I reason!) only be something powerfully associated with life and vitality and one's very identity. Since belief and ideology and conviction are based on how we feel, surely the source of conviction cannot be a belief or an ideology, at least initially, although across time the influence likely goes both directions. The very meaning of the terms belief and ideology includes the acknowledgement that they are expected to be challenged even dismissed by others. We don't call factual certainty belief. My beliefs are often not your beliefs. Belief inherently acknowledges difference. We find ourselves often called upon to test our belief, our faith, our convictions. Such tests often infer holding steadfast in the presence of refuting reason and fact. There must be some foundation that is felt with such certainty as to defy even the idea of challenge. I'm awkwardly asking the question that we often don't ask. Too naïve I suppose. Why, for all humans, do the feelings that shape our identities vary in the terms of feelings of fitness, coherence, rightness, the just-so?

---

[14] This is the foundation for creativity I find developed by the classic works of the nineteenth and early twentieth century American philosopher Charles Sanders Peirce (1839-1914). See my "To Risk Meaning Nothing: Charles Sanders Peirce and the Logic of Discovery," in *Creative Encounters, Appreciating Difference.*

This concern is where my understanding and experience related to moving become relevant. I have come to appreciate that moving is life in process. We come to life and are born moving. Moving is living. Movement, the term more commonly used, is analyzable event. Yet moving—as its very distinction is being in no place—is difficult to grasp (gasp!). Yet, the study of the biomechanics of moving, in process, offers some insight. Proprioception, occurring throughout the body in muscles and joints, assesses and senses moving as it is moving and constantly tweaks our movings by excitations and inhibitions to achieve as much as possible ongoing safe, balanced, efficient, smooth moving and to avoid injury. This principle isn't choice, it is biology. It also has a feeling component, kinesthesia, that gives us an awareness, if in varying degrees, of the quality of our movings, that is, smooth/jerky, easy/labored, coherent/incoherent. The ever-present sense of ourselves in terms of the qualities of our moving is built into our biology, Bernstein's Law of Smoothness. Proprioception (Latin *prōprius* "one's own" plus *reception*) means self-perception, sensing oneself, feeling one's own living. Kinesthesia (Greek *kinein* "to move" plus *aesthesis* "sensation"), literally moving sensation, is the sensing of the quality of moving and moving encounters. Some argue it is an additional or sixth sense rightfully placed among seeing, hearing, tasting, smelling, and touching which it is perhaps most like. Since moving is living, this makes sense.

Synergies and groups of synergies (schemas) are the biomechanical subroutines that combine specific movement elements to simplify complex moving patterns, think gestures and skills. It isn't surprising that the biological principle functioning here to create simplicity (coherence, smoothness) among the highly complex is the same Law of Smoothness. The miracle of kinesthesis makes available feelings that are located not only in various moving body parts but also generalized for the whole

moving body. It is a general and common feeling but possible also to localize.

My proposition is that the convictions and beliefs we hold so strongly as to defy logic and facts, if necessary, and that may commit us to putting life and limb at risk are grounded on this common feeling produced by kinesthesia, understood broadly. So also do those decisive moments when we just seem to know the promise of one possibility among many choices—a creative idea, a likely solution to a problem. The quality of these feelings is charted on a continuum of smoothness to jerkiness, correlating with coherence/incoherence, easy/labored. Kinesthesia provides such a powerful base because these feelings are inseparable from our very life, our vitality, our existence. The importance of my insistence on the distinction of moving and movement is especially significant here because as kinesthesia produces the feelings of our moving, they are not reflective or distanced from us, they are not the result of calculation or reason, they are our life feelings, awareness of our very vitality or aliveness. Kinesthesia, spanning the continuum from incoherence to coherence, is the qualitative feeling awareness of our own life force. What we feel is inseparable from the certainty that we exist, that we be, that we are alive.[15] No argument or fact offered can even be

[15] A caveat. Of course, the many sensory elements in the entire sensorium along with sensations of pain associated with injury or pathology complement kinesthesia. Yet, from antiquity many have mused about the sense of ownership that is associated with the biology of sensing. It is not that something is seen with the eyes and is available as a visual image, it is that the seeing, as with all other senses, is *my* seeing and I know this because there is somehow a common sense about the very act of biological sensing itself. Pain is a particularly interesting example. We have a poor vocabulary to describe various kinds of pain, yet many of those terms correspond with the kinesthetic continuum smooth/jerky, such as sharp, jabbing, piercing, dull. Physicians ask adults to rate pain on a scale of one to ten, kids on a scale of smiley face to frowny face. When we have a toothache or earache, it is pain that is *mine* without question. The only way we can feel another's pain, our empathy capacity regarding pain, is to recall a time when we

considered that might refute this kind of knowing. I propose feeling confidence and conviction about a proposition or idea or hypothesis is due to it having the same qualities as the feeling of kinesthesia. Belief and conviction have more to do with feeling experience on the model of kinesthesia than with the reason or fact of the content.

Likely my proposition seems a bit grandiose given that we commonly understand kinesthesia as the rather specific "awareness of position and movement of the parts of the body by means of sensory organs (proprioceptors) in the muscles and joints." Can I really argue that the biomechanical capability to successfully scratch my ear and be aware I'm doing so has a biologically based philosophical function as highfalutin as grounding belief and conviction? Remarkably there is a history of pondering the existence and nature of these feelings that dates from the time of Aristotle (384-322 B.C.E). Following the creative work of Daniel Heller-Roazen in his *The Inner Touch: Archaeology of Sensation* (2009), I enjoy labeling this common sense, this inner touch, with the word "coenesthesia" (Latin *coen-* "common" plus *esthesia, esthesis* "sensation"), common sense (but not in the use made famous by Thomas Paine).

The term "coenesthesia" came about as the title of a 1794 doctoral dissertation at the University of Halle by Christian Friedrich Hübner. Translated from Latin to German shortly thereafter it gained interest in the fields of medicine, philosophy, and physiology. It is this breadth of interest that appeals to me. Heller-Roazen's account locates this work in the longer history of "the shared faculty of sensation" or "the common sense" as he identified it. In *De Anima*, Aristotle discussed *koinon aistheterion* or common sense. Heller-Roazen thinks that Aristotle might have been concerned principally with the unusual neurological psychological condition of synesthesia where perceptual signals from one sense are mixed or replaced by those of

had a similar pain, but memory of pain is nothing like the pain experienced.

another, that is, where smells give color sensations. Heller-Roazen feels Aristotle's concern, that might also be referred to as synesthesia, was more likely the philosophical acknowledgement of a master power that perceives the fact of perception common to various senses. I suppose this concern seems a bit odd at first, but it is to me rather awesome and is certainly an aspect of what I understand as distinctively human. To me, there are two ways of thinking about it. When we sense the world, we do not sense it as a bunch of independent sensory signals (shape, aroma, color, mass, etc.) that we then must process one by one or that we somehow need to integrate so we might sense say a flower. Rather our senses are synesthetic in that we sense a flower all at once with all our senses, although we are also able to separate the various sensory aspects. We sense the whole flower, yet we can smell a flower or attend to its color. The second way that seems rather splendid to me is that we sense a commonness among all seeing, hearing, touching, smelling, tasting, that is we have a common experience of sensation, and that this sensation is somehow inseparable from who we are. There is a commonness in the experience of the various senses. That's why we gather them in the category senses. We can experience, as a common sense, the perception of perceiving as an act of being oneself. This, perhaps seemingly odd philosophical concern, has been a common concern from the time of Aristotle being pursued by physiology, medicine, neurology, and philosophy. Across the centuries many terms have been advanced. My collection of these terms includes common sensation, common feeling, inner touch, vital force, general feeling, inner sense, vital sense, vital feeling, feeling sense, general sensation, self-feeling, life feeling, the tonality of the sensitive nerves, elan, the consciousness of our sensory condition, general sensibility, and the complex of all sensations. In the nineteenth century with the development of medical science this common sense was associated also with pain and other general body sensations like shivering and

itching. Physiologist and neurologist H. Charlton Bastian (1837-1915), interested in movements and coordination of limbs discussed what he called "muscular sense," the likely origin of our common term "muscle memory," that he proposed registered the body moving and at rest for which he coined the term "kinaesthesis." His younger contemporary, the renowned neuroscientist, winner of Nobel in Physiology and Medicine in 1932, Sir Charles Sherrington (1857-1952), later called it proprioception which he understood as "our secret sense, our sixth sense."

Given that for over two millennia there has been persistent philosophical and biological attention given to what we now might, based properly in biology, understand as proprioception and its general sensory aspect kinesthesia, I find it strange that today it seems rarely considered in philosophy. I find that in the public, even among my academic colleagues in the humanities, proprioception is a relatively unknown word. For those who include a discussion of "muscle memory" or "common sense" or "movement," while the terms proprioception and kinesthesia may be occasionally used, I have yet to find any examples. that include even a general exploration of the actual neurophysiology involved.

There are practical gains earned by digesting this somewhat tedious discourse. First, in a world that seems overwhelmed by division and irreconcilable differences that is often characterized by nasty demeanor and outright war, it is somewhat consoling to me to understand that convictions and beliefs held so powerfully are not ultimately based on reason and fact, but on the situational context that produces feelings of rightness or givenness, coherence. While I am not happy that I feel helpless to change others, while I am no less angered and disgusted by those who seem to understand reality so differently than I do, I can at least take some measure of solace and the hope of a shred of empathy in knowing that the power of belief and conviction is a part of what makes us so distinctive as human beings.

Our animal kin may eat one another, but they don't call those different from them nasty names. The positive side of my proposition helps us understand such things as patriotism, love of country, rooting for the home team, loving one's family members even if they are nasty people, believing in our own god not those gods of our neighbors, even having our own distinctive tastes.

Living our own gestures, practicing our own skills, feeling our own moving bodies is how we be who we are. Knowing how fundamental and pervasive are these movings, encourages me to attend carefully to the exercise and maintenance and practice of my own movings, however banal. The results are felt in their kinesthetic quality. The more skilled and practiced our movings, it seems the smoother and easier and more confidently we experience our vital force.

15

Gesture

In 1934 French sociologist and anthropologist Marcel Mauss (1872-1950) wrote an article titled "Techniques of the Body" that is widely considered as initiating the modern study of gesture. Mauss noticed that quotidian practices such as swimming and eating and walking and touching others vary from society to society, culture to culture. Some societies hold eating utensils in both hands, say a knife and fork, while others use no utensils at all, eating with their hands. When I was in Bali years ago, I hung around with a group of young men. I noticed that they shared a distinctive way of walking. One night as several of us were walking from one village to another I decided to try to walk like a Balinese young man. My friends immediately noticed and found my efforts hilarious. To greet others some cultures bow, others shake hands. Observing that these techniques of body vary led Mauss to conclude that there is nothing natural about them. Nor could one argue any technique to be more perfect than any other. Yet, placing Mauss' analysis in a larger frame, I would suggest that, for animate organisms, species distinctive patterns of movings, as shaped by evolution, are species natural. It might also be noted that the existence of such experientially constructed techniques of body is itself an essential aspect of human distinctiveness, that is, gestures are a natural aspect of being human, as well as animal. There are many understandings of gesture, but Mauss showed that they reflect and enact culture and that gestures are essential to enculturation. Yet, how do we effectively study and understand gestures?

I lived for a time with the Navajo in northern Arizona. They do not make eye contact with the person they are talking to. I was constantly saying "huh?" thinking someone was talking to me just because they faced in my general direction as they talked to another person. They point with pursed lips not with an extended finger. They move sunwise (clockwise) around a space. Their greetings often take an extended period and include recitation of clan lineage so that the expected gestures that correlate with specific relationships will be properly practiced. I knew none of these gestures at first and was constantly confused and committing social faux pas. Fortunately, the Navajos found these humorous after they got over being shocked.

When I was in Mali in my late fifties, I danced with dancers in their twenties and did my best to dance the same as they did. It seemed to me the proper thing to do. On several occasions I had older women come up to me and get down on their knees and place their hands around the calves of my legs. I had no idea what this was about. I was told that they were baffled that someone old like me, white hair and all, would dance the dances of young people. Had I been Malian, I was told, it would have been inappropriate. But because I was American, they were not offended but rather impressed at my capacity to dance like the young. Their gesture was intended to complement me. In Mali, as other places I've been, I often found men holding hands with me as we walked along and chatted. Mali men spend amazing amounts of time making tea with ritual preciseness. On and on.

I have increasingly come to appreciate how important are these patterned movings that are acquired mimetically often without our awareness as we live our lives encountering our distinctive environment as members of families and social groups. The specificity of these patterned movings is indexed to culture, history, and individual experience. I've come, as have others, to call these patterns, these techniques of body, gesture. The word gesture dates from early

fifteenth century, "manner of carrying the body," from Medieval Latin *gestura* "bearing, behavior, mode of action," from Latin *gestus* "gesture, carriage, posture." The use of the word indicating "a movement of the body or a part of it, intended to express a thought or feeling" is from the 1550s. The variation that indicates "action undertaken in good will to express feeling" didn't occur until 1916. Importantly while I'll consider posture in another essay, the very root of the word gesture suggests the inseparability of posture and gesture.

Gesture is sometimes, perhaps most of the time, understood as a substitute for language, used when language is inconvenient. We use a distinctive extended thumb gesture to try to get a ride from a passing vehicle when it is inconvenient to ask for one. We use a thumb pointing up or down to indicate our approval or disapproval. We use hand gestures to communicate with another across the room when we cannot be heard or when silence is expected. The enthusiasm of a waving hand often correlates with social status; think of the queen's wave. This view of gesture implicates a specific message or meaning attached to a particular gesture. Gesture is also often understood as the decorative hand (maybe also head and body) movements that accompany speech sometimes often with the effect of emphasizing some aspect of speech. To show that we are emphatic about a statement, we make a striking gesture with a hand. To indicate a specific person addressed among a group, we may point a finger. We hunch the shoulders and lift the hand up with palms up to indicate "I don't know" or "Why?" Such gestures often are sufficient for a response without the words. While, within given contexts, both understandings of gesture—substitute for words and decorative or emphatic—are valid and useful, I'm not satisfied with the adequacy of either. The one is too explicitly tied to communication, to speech, to statable meaning, the other is vague often to the point of being whimsical. Mauss' "techniques of body" however offered

for me the beginnings of a more acceptable understanding of gesture, a term he did not use. Others, such as French sociologist Pierre Bourdieu (1936-2002) used the term *habitus*, which Mauss had used before him. A key term in Bourdieu's social theory, *habitus* refers to posture and socially engrained habits, skills, and dispositions. The argument is that the distinctiveness of societies and cultures is acquired and expressed in the common patterns of movings shared among members, that is, culture is borne by *habitus* or gestures. What is needed, I think, is to set this view of gesture in the context of biology and philosophy.

Biomechanically I think gestures, like skills, are comprised of synergies, subroutines or macros of movings that can be linked together. There is perhaps a continuum linking and overlapping gestures and skills, but I see them distinguished largely based on the consciousness with which they are acquired and used and on their complexity. Many gestures, I suggest, are acquired through mimicry that is simply common to living in a community. We just do what everyone else does. The knife goes on the right. The napkin goes in the lap. Pointing is done with the lips. Bowing is how one greets another. Drive and walk on the right. Don't make eye contact with others. Make eye contact with others. Reading begins on the right and goes left. Our lives are comprised of hundreds of these culturally based gestures. Few of us could indicate specifically when we learned them or even how. They are just what we do. Few of us spend much time consciously practicing them. If asked what it means to bow or to point with lips, we might try to make up something or just admit "that's just what we do." We become most aware of gestures, both our own and others and even the existence of gesture, when we travel to a society that has different gestures. Gestures are usually naturalized in the development of synergies. That is, while there is nothing natural about them, as Mauss held, or as I prefer to say while gestures are generally markers of identity, through their repeated and standardized use as common to

a group, gestures come to be experienced as natural, as just-so. And importantly becoming naturalized is essential to their function. Our world is encountered and negotiated physically, often even including micro-gestures (gestures of face and body that are detected and reacted to beneath the level of consciousness), and all are biomechanically borne by acquired synergies. Gestures are often relatively simple movements: a wave, a bow, a body orientation, a hand-shake, a head shake. I think it suitable to extend the idea of gesture to clothing, make-up trends, body decoration, even speech patterns; there is, I suggest, continuity among gesture and mores, customs, style, and norms.

I'm amazed by our ability to sense and respond to micro-gestures and surely not enough attention is given to appreciating them. I feel that once we become more fully aware, the importance of exploring micro-gestures will be equivalent the discovery of germ theory (maybe a micro-hyperbole). A couple of brief examples. In the presence of a close friend, we often feel how they are feeling. We sense their mood. Not magic, but the magic of sensing micro-gestures. Another. I have read analyses of how long a ball pitched at ninety miles an hour takes to reach a batter compared with the minimum reaction time of the batter to see the ball and engage the accurate swing of the bat to hit the ball. The timing is based on the constraints of speeds of neurotransmission and action potential. Better batters don't have faster reaction times, they are able to better read the micro-gestures of the pitcher and begin their swing before the ball leaves the pitcher's hand. I think we have a quotidian capability of sensing and responding to micro-gestures and, as this is done without full consciousness, we are largely unaware. I'm thrilled by the vastness of the potential of micro-gestures as they are also micro-movings.

As a student of religion, I have spent much of my time studying ritual. Oddly, as common as is ritual to our general understandings of religion, it is in my view under-studied. I think this is because academics are naturalized, a mark of

the profession, to consider writing as the principal gestural action that bears cultural identity. Yet, rituals are comprised almost wholly of gestures developed and maintained often over centuries. Even the natural language found in ritual is gesturalized as formulaic and highly repetitive. I wrote an article on prayer as gesture. While academics focus on statements of belief and the meanings of scripture and theology in their studies of religion, those who practice religion focus much more on ritual practices and the daily way of living. Even beliefs are bound in the gestural nature of recited creeds and pillars of faith. I suggest that the longtime practice of ritual for most religious folks constructs the very specific moving grounded experience of coherence that is the basis for the living of their religious lives. Ritual is comprised of gestures that are often described as constituting a way of life.

Skill, as I distinguish it from gesture, tends toward much more complicated synergy complexes. Skill is also usually more consciously acquired involving a process of high repetition and critical attention. Skill is often based on labeling synergies that are understood as moves and techniques. Dances, musical instruments and types of music, sports of all sorts all have extensive specialized vocabularies labeling synergies and schemas. Common gestures rarely so. Skill is also usually open ended, with no point when complete mastery is gained, that is, perfection always remains an unobtainable goal.

Perhaps somewhere in the middle of this continuum from gesture to skill are things like the old-fashioned finishing schools, or debutant training, or cotillion. Formalized gestures become manners and etiquette. Ballet is believed to have developed from the proper gestural etiquette in the French courts of King Louis XIV. In these settings the practice of gesture is treated as an acquired skill based on careful practice under a sharp critical eye. Perhaps another example is the formal learning of American Sign Language to serve the deaf community. Interestingly ASL combines

some literal equivalence to natural speech, as in the signs spelling out words, but much of it is an artful form of communication that requires studied and practiced repetition for the acquisition of skill.

To understand gesture as comprised of patterns of movings, is to place gesture in the realm of interaction and perception, that is, the realm that extends beyond the physical limitations of the body of the one gesturing. Gesture expresses as it inquires. It has an efferent (outward) trajectory as does all moving. Yet gesture has an essential function related to feeling kinds of knowing, to grounding choices of action and value. I suggest that, in the terms I discussed regarding smooth efficient movings as the biologically dictated goal of proprioception/kinesthesia, as gestures become synergies—whose function is to create smooth efficient moving—they are experienced as just-so, as natural and performed with ease. Living is the performance of a gestural repertoire that is welded to social and individual identity. We *be* who we are by gesturing our identities that also manage our encounters. Our system of repeated gestures then becomes a constant base experience for our assessment of coherence, fit, congruity, for what feels right and natural. In our encounter with others as we negotiate socially through the diverse world, the gestural differences often feel jarring. Others, foreigners, outsiders, even neighbors are known as such because we often experience their gestures as incoherent and odd, not right, if perhaps curious or exotic. Otherness is often distinguished by the feeling of the incoherence of gestures, especially if gesture is understood rather broadly as I've suggested.

As an academic who studies the religions and dances of cultures across the globe, it is customary to attempt to discover and assign explicit meaning to the actions and behaviors that distinguish others. What I have found to be consistently uncomfortable when practicing this academic enterprise, is offering my conclusions as to what their actions and behaviors mean to the subjects of my study.

They are often simply baffled by my labored interpretations, but even more so by my sense that such a process is of any value. Asking others why they do certain actions or, even more explicitly, what these actions mean is commonly met with consternation and the answer given, if one is offered at all, is "it is just what we do." Of course, should they turn the tables and ask me to articulate the meaning of my own gestures, I think I'd be equally baffled. Over the decades I have come to understand that gestures, in themselves, do not so much mean anything or communicate anything explicitly. Gestures comprise the milieu of moving behaveiors that gives a society, or group, or individual a sense of grounding, a feeling of rightness, a base from which to live effectively and predictably among the peer group and so that encounters with the exigencies of life and with those outside one's family, society, gender, age, peer group might be evaluated and managed. Our collection of gestures is the sea in which we swim. It is in service to the constant need to negotiate the paired felt condition of coherence/incoherence that gestures are essential and powerful. Our repertoire of gestures comprises who we are. Our gestural lives are how we enact our moving identities. Our gestural lives offer the moving mechanism to negotiate our encounters with the world and others.

In practical terms, awareness of how gestures come about is inseparable from appreciating identity formation. Gestures are basically collections of synergies. They are makers and bearers of identity. They serve to negotiate the dynamic of coherence/incoherence, that is, they offer a grounding for value assessment and action. All these understandings help us become aware of the depth and richness and power of gesture and equip us with empathy and tolerance as we encounter others and sharpen our awareness of being who we are.

16

Posture

Growing up many of us have a humorous and awkward association of posture with our mothers telling us, in no uncertain terms, not to slouch, to stand up straight. While mom-harping doesn't much impact our behavior, we likely sensed that moms recognize a link between posture and character. We describe moral qualities with such terms as "upright" and "upstanding" and "he ain't no slouch." Often first impressions are colored by near unconscious assessments of posture. Perhaps our moms were beseeching us to become good people. Posture traits are often marked by position of shoulders (hunched, dropped, rounded) and back or spine (both side to side, erectness and stiffness, and the impact of the pelvic tip on the spine). Postural traits are often especially noticeable in standing, walking, and sitting. It is common to think of posture as position. The word posture is from the Latin *ponere*, "to place." We even use the word posture sometimes to refer to one's attitude or perspective or stance on matters. And sometimes we identify the word as referring to an artificial attitude as in having a posture or posturing regarding something, akin to the related popular word "poser." Posture suggests the position of the body with respect to the surrounding space. Physiologically, posture is commonly recognized as determined and maintained by coordination of the various muscles that move the limbs, by proprioception, and by the sense of balance. And this physiology is worth some reflection.

I'm sometimes slightly embarrassed by my own near obsession with observing the posture of those around me. I keep my observations to myself. Even on a casual walk I

often find myself analyzing the postural elements in another person who may exhibit a dropped shoulder, a side-to-side movement or wobble while walking, a favoring of one foot, kyphosis, the turn in of a foot. Being around hundreds of young dancers for years I've been stunned by how many have rounded shoulders and radically tipped pelvises. I'm often astonished that most little kids sit with a nice upright posture, rarely using the backs of chairs. That posture seems to rapidly fade as we age.

As I have gained knowledge and appreciation of self-moving, especially the complex multi-system coordination of remarkably complex biological elements, I have shifted from the identity of posture with place, a fixed physical alignment, to appreciating the subtle organism-wide moving dynamics that comprise posture. To use a musical metaphor, there are vast tensional dynamics at play in posture, with perhaps a better way to evaluate posture being in terms of how all these parts are tuned and harmonize. We often refer to muscle tone (tonus) to indicate the alertness and readiness of muscles to respond indicating the dynamic health of the muscles. Saggy flabby unengaged muscles do not have tone. Knowing that the muscles are but one system within many that must also be engaged, we can appreciate that posture is also dynamic and not only reflects the status of health but contributes to it. Posture, while implicating place and position and stance and stability, is a concerto of the interplaying biomechanical tones constantly responding to internal and external encounters to maintain readiness and to perform action.

My favorite philosopher, the late Michel Serres (1930-2019), writes in near poetry. One of the few philosophers who engages such bodily things as feet and posture, he writes in his amazing 2011 book *Variations on the Body* of the gateway to ecstasy that he sees as the postural biomechanics of walking, running, and dancing.

> Those who believe that the upright posture founds its stable position on two foot arches, wide

> enough to form, with the interval between legs, the famous support polygon, and who view us as though we were a statue on its socle—this last word signifying, precisely, the sabot—do they understand this triple defiance of balance on a narrowband tire, above a circle, in addition, and in motion, to top it off?. … Walk, run or dance, now and note that the multiple and flexibly articulated movements of the thighs, calves, knees and ankles propagate, underneath the foot, starting from the heel, perhaps continuously, up the metatarsal head and the toes, as though the entire arch of the foot were unfolding, round or convex, and not as an interior or concave vault. … We stand on two flat bases, no doubt, but we move about on two small segments of circumference, for, contrary to the curve of their arches, the feet function as arcs. Where do the so intense delights brought by walking and running come from? From the fact that each step, each stride rolls without jumping, elastic and continuous, passing through the hollow of the sole to raise itself toward the tips of the toes: the foot, a flight board, changes these two promenades into promises of ecstasy.[16]

Those who find the body so odious and sinful, those who consider the body but a vehicle for the mind, and those posthumanists who seem to think that it is time we must move on from the limitations of being human to the advancements of machines … to all these folks, I suggest they read Serres and then go out dancing or take a walk.

My interest in the distinctiveness of human beings often draws my attention to evolution. Through the long

---

16 Michel Serres, *Variations on the Body*, 116-17. I've read this book several times and made detailed notes. I have also considered it perhaps the top of the list of books I'd want were I to find myself abandoned on an island.

durée of evolution the various species of our animal kin, including us humans, have gained their distinctiveness. Posture with the accompanying effect on motility is a basic mode to articulate species distinctions. We humans have evolved to achieve a bipedal upright posture. This posture includes the relationship between hands (with opposable thumbs) and face (with its concentration of sense organs) and between the arms and the environment, all necessarily associated with the development of a larger brain with its distinctive capacities. Upright posture requires bipedal motility, the distinctive structure of feet, the ability to spin. The difference between being quadrupedal and bipedal also stunningly shifts the exposure of gendered sex parts. The sex parts of female quadrupeds are exposed, the males hidden. This reverses for bipeds. Posture then is also a way of both connecting us humans with our animal kin as well as appreciating our distinct humanness among them. Along with upright posture and its various biological adaptations, comes speech and reflective thought (philosophy). Might we say philosophy is a gift of bipedalism?

Posture reminds us that we are whole bodies comprised of lots of parts and systems, yet all those components are dynamically interrelated. If we break an ankle, for example, and for a period favor putting our weight on it, we may discover that we begin to feel pain in a hip or even a shoulder. We realize that our ankle and hip are connected and an injury to our ankle shifts our posture in ways that often have a noticeable impact elsewhere in our body. Sometimes an injury may create shifts in synergies, macros of movings, that remain after the injury heals. Over a lifetime of experience, we often discover that persistent discomfort and pain in one body area can be traced to an earlier injury in another body area. When one thinks of the injuries and impacts experienced over a lifetime, it is little wonder that, without careful attention at correction and amelioration, as we age, we become less mobile and capable of moving efficiently, imbalanced, and in pain. It is well

known to body workers that correcting postural problems can be highly emotional for their clients. Our bodies, especially our posture, carry our life stories. Our routine activities and professions often shape our posture. Academics, my own peer group, spend their lives sitting (slouching?) hunched over a book or a computer. We develop kyphosis (head forward and humped shoulders and back), our hips widen, our belly grows, and our legs and feet are often weak. If we ever get up and walk, we walk with an academic posture. Our posture reflects our personal history. Professions have postures.

Importantly we must recognize that posture offers a system of referencing the health of the dynamic unity of the complex and highly diverse common organism that we are. Posture is the interplay of unity and multiplicity.

Posture, as the attitude and dynamic of the whole body, is foundational to moving. It is the core, a term we often use to refer to the abdominal area, which offers a dynamic platform for the relative movings of limbs and appendages. Were it not for the relative dynamic stability of the body core, we would be unable to independently move an arm and hand or to move one foot and then another. Posture suggests the unified core exchange of all the implications that ripple throughout the body that allow and reflect any movement of a body part. Even extending an arm to the side of the body reverberates with endless micro-adjustments throughout the whole body; millions of proprioceptive adjustments to retain balance and posture. These adjustments are observable often by a tiny shift in weight that realigns posture. Synergies, or movement subroutines, that comprise gesture and skill, are inseparable from and impossible without posture. I'll discuss this interdependence of posture and gesture more fully in another essay.

Kinesthetically posture echoes the foundational strategy of proprioceptors and synergies which is to achieve smooth and efficient moving. The experience of moving is

felt often as a whole body, as a general sense of ourselves. I have discussed this wholeness in another essay as Aristotle's idea of a common sense or in my favored term "coenesthesia" that dates from the nineteenth century. Certainly, we might feel the quality of an arm or leg movement, but even these localized feelings are hardly separable from a whole body feeling. Posture then is linked to kinesthetic feelings, a common sense of ourselves, our well-being. While the sensations are initiated most likely in the proprioceptors themselves, the quality of moving is felt in and as the living moving body. Again, the body and all the parts and functioning systems that comprise it are both distinguishable and inseparable, one and many. Posture is a physical and philosophical mechanism to comprehend and articulate this dynamic interdependence. Kinesthesia cannot help but influence our emotions, our sense of wellbeing, our confidence, and sense of ourselves. Attending to posture encompasses the whole moving organism, including our self-image and our emotional landscape, and we experience postural adjustments as feelings of smoothness/jerkiness, effortlessness/labored often correlating with pleasure and pain.

Perhaps our moms were wiser than we thought.

17

Prosthesis

> The subject exists only on the basis of its own withdrawal; it is fulfilled only by exteriorization. ... it is in the sense of a being that it is its own quest and that therefore possesses its essence outside itself.
> Renaud Barbaras

Long ago I built my own house in the mountains west of Boulder, Colorado. Bruce was an artist friend making lathe-turned delicate thin bowls and vases out of fascinating burls. He graciously came to help me for a couple days on the house construction. My method was crude and rough—it was after all the internal framing—but his every sawcut was precise and time consuming. I teased him, telling him we weren't building a piano. He loved to make wooden tools to assist him in working with precision. The tools he made were themselves works of art. They extended his technique beyond the capabilities of his own muscles and grip allowing him to realize his artistic imagination. He fulfilled himself through this artful exteriorization, this reach beyond.

Renowned choreographer Twyla Tharp described how she "makes work," a provocative term choreographers commonly use to label their arting, saying she does her best to set aside her mind to let her body do the work. At first, I was shocked by what appeared her Cartesian separation of mind and body, even though she reverses the usual hierarchy. The last thing I'd expect from a dancer. Perhaps, I mused, her mastery of dancing skill and artistry was so great that it gave her creative freedom earned by long

repetitive critical attention to acquiring technique. With her mastery, the brain and nervous system, key parts of the body for sure, remain highly involved yet free of the need to consciously direct the body. Perhaps by mind she intended only heavily involved conscious direction. Yet, alternatively, perhaps Tharp was referring to the instrumental function of her body as is commonly done by dancers analogizing their art to that of musicians, their bodies to musicians' instruments. Put a bit more crassly, perhaps she was referring to her body as a tool, although one with some autonomy from conscious direction, an autonomous tool perhaps. She sees her body as a tool distinct in it being at once her subjective body, that is Tharp herself, and an object whose own self-agency she trusts to be most creative when beyond her explicit conscious mental control. Then again maybe she was suggesting that the moving of her body has primacy and that her mastery of moving as a dancer and choreographer gained over decades of practice gave her the freedom to be creative. Being overly mental would simply distract. I don't know which of these perspective Tharp holds, yet her statement focuses our attention on the aspect of the complexity of dancing where body is both maker and thing made. The dancer/choreographer realizes herself only in her remarkable extension into the world. Surely the fascination and power of dancing comes with both the separation and sameness (identical) of maker and thing made, of subject and object. This is a remarkable example of what I call an aesthetic of impossibles.

This example of making, a subject I've long been interested in exploring,[17] offers insight into body, moving, tools, and work and the agency to impact the world. Bruce used his hands, assisted by woodworking tools, to made other tools, external to his body, to assist in his making of

[17] Making is the persistent theme across all the essays comprising my *Religion and Technology into the Future* (2019).

wooden art objects. Twyla considers her body itself, in some sense, a tool for the making of an ephemeral but bodied art, dancing. In dancing the art made is also the body moving as maker and as tool and as thing made. These provocative ambivalences or copresences related to tools and bodies fascinate me. We perhaps think of tool as a material object that we use, most commonly by the hands, to accomplish certain tasks, hammering, sawing, screwing, cutting, arting, photographing. We may buy or rent endless kinds of tools to assist us in our tasks, each tool tailored to a particular function. But as Twyla Tharp and dancers show us, we may use our own bodies as tools or instruments and, I think, we can do so without an unfortunate Cartesian break up. In his classic 1936 essay "Techniques of the Body" Marcel Mauss wrote, "The body is man's first and most natural instrument. Or more accurately … man's first and most natural technical object, and at the same time technical means." Hands and arms and knees and legs and hips and most any specific body part may be used in a way similar to our use of the tools we buy at the hardware store. We even consider them material objects when we do so. "I'm going to pound down the dough with my fist." "I put my shoulder to the armoire to move it a few inches." "Okay kids we are going to finger paint today." My body part, inseparable from my subjectivity, is used as a material object, as a tool, a thing. Paleoethnographer André Leroi-Gourhan (1911-1986) considered the hand to be the first tool; later I'll offer an alternative. We can use our hand to pound, to grip, to squeeze, to hold, to paint, to palpate and many other things and in so doing we think of it as an object, an object that extends our bodies into the world with agentive intent and effect.

Tools, whether a part of our bodies or material objects held or used by our bodies, extend, exteriorize, enhance, and interact with the world beyond the physical limitations of our bodies. They have a prosthetic function in service to agency and encounter with the environment. Prosthesis is

often associated with amputation; a prosthesis is the replacement of an amputated biological part or limb with an artificial nonorganic device. Thus, most common among associations with prosthesis are jarringly non-organic materials because they replace living flesh, and usually a violent horrifying disfiguring and debilitating loss. Historically the context in which much of the discussion of prosthesis has occurred has been one in which wars have produced great numbers of casualties, many suffering the loss of limbs. Based on his experience with amputees from the American Civil War, during which many injured warriors survived only because of advancement in amputation surgical technique, Walt Whitman was among the first to write of what we now call "phantom limb syndrome," the persistent pain sensation that feels like it is occurring in the lost limb. We have a powerful and extensive context in which to strongly link prosthesis with amputation. Even those who have written of prosthesis in the context of a non-war or tragic accident considering it in more general terms of extension have tended to continue the link between extension via prosthesis and amputation, perhaps due to a kind of puritan morality that demands a high personal price for the effort to reach beyond ourselves. We need think more about these associations with prosthesis; they reflect our sense of agency and body.

A stereotype prosthesis is linked to our romantic images of pirates—I haven't a clue why beyond the popularity of some pirate fiction—with their quintessential peg legs and hooked hands. Limb prostheses, even today as we think of the blade prostheses of leg amputee athletes, are often odd-looking attention drawing objects. The materiality of prostheses can be linked as well to industrialization. As factories filled with machines and assembly lines developed in the early twentieth century, these machines, these tools, were referred to in the terms of how they might be operated, functionally as prostheses, by disabled workers. Henry Ford wrote oddly about his automobile

assembly line technology that "could be performed by the slightest sort of men [or] satisfactorily filled by older women and children. [Of these] 670 could be filled by legless men, 2,637 by one-legged men, two by armless men, 715 by one-armed men and ten by blind men."[18] Prosthesis is strongly linked with biological loss, yet I believe new insights about moving bodies are won when we move beyond this limitation.

My preferred use of the term is more in line with its etymology suggesting prosthesis as the extension of the body. Prosthesis has its roots in the Greek *prostithenai* "to add to," from *pros* "in addition to" plus *tithenai* "to put or to place" (same root as for "thesis" meaning "to put forward a premise or a proposition"), thus prosthesis is to put or to place in addition to or to extend. It does not require or even suggest amputation, loss, or replacement. It is the act of putting forward *in addition to or as extension* rather than specifying or limiting the character of that which is put forward. Prosthesis is action not thing, yet the action may involve thing, usually considered tool. Prosthetic action designates a reaching beyond, an addition to or an extension of the limits of our physical bodies. I hold we must avoid limiting prostheses to some materiality or to any necessary connection with loss (amputation). In the most direct and obvious sense prostheses are our skilled or practiced use of tools and toys; those action-things that allow us to reach farther, amplifying our strength, capability, creativity, and agency. Prosthesis makes imagination literal and material. Prostheses lengthen our arms, support our bodies, and externalize our thoughts and memories. Prostheses are generally action-things that we make or objects that we designate for specific use that reflect, echo, imitate our bodies in some respect and how our bodies function.

---

[18] Henry Ford, My Life and Work (1923) quoted in Sarah Coffey, "Prosthetics" http://csmt.uchicago.edu/glossary2004/prosthetics.htm

In her 2007 book *The Body in Pain,* Elaine Scarry argues that most everything that humans make is an extension and amplification of the human body. A shirt has arms, a body, and a neck. A camera has a body and a lens (eye). A chair has a seat, legs, and back. Nearly everything in material culture might be seen as prosthetic in some sense particularly when conjoined with moving and use. We have the propensity to personalize inanimate objects, giving them names and personalities, as consistent with the exteriorization power of prosthesis. Scarry shows that things made tend to fold back to amplify and multiply aspects and capabilities of the body; others might suggest that in this folding back we are reminded of amputation or at least the limitations of the body as such. My preference is to focus on amplification. I often find myself contemplating the long sequence of tools that had to be serially developed to accomplish things like building an automobile, erecting a skyscraper, sending a person to the moon. Each of these accomplishments had to have started with the making of one tool that amplified body strength and imagination and skill to make another tool that amplified that tool's capabilities to build yet another more capable and powerful tool, on and on. In transcending the limitations of the body, or better amplifying the body's capabilities, in some sense by these prosthetic makings, the body remakes itself, enhanced, expanded.

It was Leroi-Gourhan who reminded that the tools of early humans were best understood in terms of the gestures, I'd add the skills, required to use them. Every tool necessarily reflects intention, purpose, and agency. The inherent association of function and purpose and effect are borne in the specific design of the tool. We do not hammer nails with paint brushes. Prostheses (tools) are inseparable from moving gestural body, expanding by extending the faculties and powers of the body into the environment. The prosthetic body *others* itself by worlding as it realizes itself.

In his provocative essay "Exteriority," phenomenologist Renaud Barbaras helps us appreciate that there is an inherently prosthetic—we could say transcendent—aspect of self-moving. He writes,

> the intrinsic nature of living movement [what I refer to as self-moving] is such that it cannot be abolished, but on the contrary is ceaselessly renewed, amounts ipso facto to recognizing that this movement never completely attains what it aims at, never comes to possess what it seeks to grasp; the object of this movement is irreducible, it is not spatial, which amounts to saying that this Distance is not to be confused with a simple empirically measurable length. … this Distance is ontological; … there is an otherness about the world of living organisms that, far from being an obstacle or a threat to life, is in reality its very condition of possibility. … The life of living organisms brings us face to face with the enigma of a primordial spatiality: ontological Depth maintains a distant otherness at the very heart of an approach, precisely that distant otherness without which life would not be possible (107).

Self-moving is always a moving beyond, an encounter with exteriority, yet not essentially to satisfy a need, a specific goal, but as self-moving itself always implies a there that is never reached, it "never comes to possess what it seeks to grasp." Self-moving is self-othering. Self-moving exemplifies an aesthetic of impossibles in the most fundamental sense of being a distinction of the self-moving living human body. Its otherness, its transcendence, its prosthesis, is the condition of possibility, of life itself.

I suggest an alternative candidate to the hand that Leroi-Gourhan considered the first tool. I offer the pointed finger of an extended arm as the first tool. It functions to direct the eye to the finger and then beyond the finger to an

object to which the finger points. The pointed finger tool serves to make a virtual connection by the eye between the pointing finger and a discrete object at a distance, establishing at once the identity of the finger and the corresponding object. This tool also creates the virtual identity of the here (finger) and there (object), the identity of the designator and designated, with the obvious awareness that the finger and object are both the same and not remotely (in its various meanings) the same. More profoundly the connection to the object is also confirmed with a word, an idea, a neurological profile, revealing the prosthetic function of this most primitive of tools. This prosthetic action is the foundation for perception, symbol, language, metaphor, art, and so many other distinctively human capacities. I consider this finger pointing example as a basic example showing how cognition, as distinctive to humans, is interdependent with self-moving. Several things are essential to this process. Upright posture that frees the hands in the space anterior to the face. The connection of eye and hand are then enhanced, even emphasized. The pointed finger as tool directs the eye first to the finger, yet the gesture of pointing, directs the eye beyond to some distant object requiring it be separated out from the full field of vision, otherwise amorphous. The distinctive ability of the finger to point directs the foveal area of vision (likely evolved in connection with upright posture and fingers) to a limited area at a distance, focusing on a specific object distinct from the general environment. The cognition is the identification of a generalized mental pattern or profile formed from encounter, at a distance, with the object in its distinctness, a bird not a rock. This neurological pattern is not so much a picture as it is a general heuristic suggestion, a profile or sketch or schema, open to constant refinement based on ongoing experience. Cognition requires the recognition of a distinct pattern with the raw sensory data collected by sight likely simultaneously and synesthetically including other sensory data. The process involved with

recognition is the ongoing negotiative process of matching raw sensory data with the ongoing construction of profiles and schemas. There is no first cognition. The mental construct is an altogether different form of reality than is the object at a distance. One is an ensemble comprising a neural network corresponding with sets of sensory data, the other the objective concreteness of the world. The one "in here," the other "out there." I call this characteristic of human cognition, this common structurality, an aesthetic of impossibles, holding as identical what we clearly know are impossibly so. All cognitive objects and processes that are accompanied by awareness require this remarkable aesthetic. This example further helps us appreciate the conjoined virtual and material characteristics fundamental to cognition understood as "the mental action or process of acquiring knowledge and understanding through thought, experience, and the senses." The example also demonstrates the primacy of the prosthetic aspect of gesture/tool to the cognitive process.[19]

Prosthesis is action, whether involving an external objective material tool or a part or all the body directed beyond itself in gesture. Action is moving. Prosthesis is comprised of moving, often done with clear intention, as extending ourselves into the environment. While moving may at first seem limited to the body in relation to itself, its location and perception of itself, its prosthesis reminds us that moving is the ever-changing encounter of body with world. Proprioception is sensing the moving self and is

---

[19] Michael Levin & Rafael Yuste, "Modular Cognition" *Aeon*, March 8, 2022. https://aeon.co/essays/how-evolution-hacked-its-way-to-intelligence-from-the-bottom-up (consulted 3/31/2022). Esther Thelen and Linda B. Smith's 1994 book *A Dynamic Systems Approach to the Development of Cognition and Action* indicates an agreement with neuroscientist Gerald Edelman who holds "that perceptual categorization, as broadly defined to include perception of self-movement as well as signals from outside the individual, forms the base of cognition and action" 144.

operative in both the discovery of self and the feeling of life and vitality. Prosthesis is moving beyond self, giving experience of the distinction of self from other, from environment. Prosthesis is the interpenetration and interdependence of self and other as it simultaneously distinguishes self and other. Prosthesis allows us the appreciation that moving overcomes utter containment, isolation. Thanks to the prosthetic aspect of moving, we are not alone. As moving is in no place, an ongoingness that implicates a here and a there yet never realizes either, it is inherently prosthetic, a process of always extending beyond, a moving always beyond the mover. Simply put, yet with major implications, prosthesis is transcendence, a reaching beyond our seeming physical limits, even an extension of ourselves into the world. As the experience of the moving body gives rise to concepts, potentially considered tools themselves, it surely informs the most abstract concept we call "transcendence," enabling our creation and experience even of the gods.

Carrie Noland noted that Maurice Merleau-Ponty and André Leroi-Gourhan "viewed the body as a sensorium extending itself prosthetically through gesture into the world."[20] The sensorium, hierarchically ordered by cultures, is the composite of the traditional senses plus proprioception (or more properly kinesthesia). What Merleau-Ponty and Leroi-Gourhan were noting is the rather obviousness of the prosthetic function of the senses. Perception extends, transcends, the body as its fundamental function.

[20] Noland, *Agency and Embodiment* 5

18

Gesture, Posture, Prosthesis Nexus

> The body is this being that exists in the mode of relationship and comes back to itself—constitutes itself on the basis of its entry into exteriority.
> Renaud Barbaras

> Maurice Merleau-Ponty and André Leroi-Gourhan viewed the body as a sensorium extending itself prosthetically through gesture into the world.
> Carrie Noland

There is an essential entwinement of gesture, posture, and prosthesis. While they may be considered independently, as I have done, they pair up dynamically, comprising a tripartite nexus that can be understood as one way of appreciating the power and distinction of self-moving that characterizes animate organisms. I will build toward this nexus by considering the three constitutive pairings.

Posture and Gesture

Consider the newborn lying supine in her crib with arms and legs stretching upwards groping about. It is simple physics or, better, biomechanics. The mass of arms and legs relative to the trunk or core of the body allows the arms and legs to move as the trunk of the body remains relatively stable. Imagine a body comprised of only one arm and hand extending from a body of similar size and mass. A crazy image to be sure. A contraction of the muscles to move the arm would result in equal movement from both the arm and trunk if neither were attached to anything stable. The human body is designed and refined over eons of evolution

to maximize freedom of limb movement by stabilizing the core. If we think about posture as the organic composition of the whole-body design including its modes and capacities to move, then clearly there is an interdependence of the patterned movings of gesture/skill and posture. As dancers learn to spin (pirouette) they discover that core strength, abdominal strength, correlates with successful spinning. Body movement is often initiated by a counter movement of limbs. To maximize the speed of a thrown ball requires the amplification of the moving mass of the thrower's core by the lever of a swinging arm. The intricate varying touch of the fingers on piano keys to produce a wide range of volume and sound qualities is possible only because of the anchoring of finger, hands, arms in the core body mass.

The movement of any part of the body (gesture) is inseparable from the composition of the entire organism (posture) and its infinitely complex neuromuscular bio-mechanical integrity.

Posture—the composition and construction of the body, the alignment of the body, the mode of motility, and the internal biomechanics—functions as the platform supporting gesture—the patterned movings of the whole body relative to the environment and the various parts of the body relative to its whole. Bipedal motility correlates with the development of brachiation—the gestural physiology of overhand throwing or hanging and swinging by the arms—whereas with quadrupedal motility brachiation is not possible. Dogs and horses don't throw overhand nor hang from a tree. When travelling over rough terrain hoofs and padded paws work fine for quadrupeds with advantages over the complex construction of human feet. Humans, absent hoofs and paw pads, have had to invent shoe prosthetics to adapt to rough terrain. But hoofs and paws on extended forelimbs of upright walkers wouldn't work so well for watch repairs or writing with a quill pen or typing on a keyboard or threading a needle as

possible for human bipeds who have forelimbs comprised of arms and hands with fingers and an opposable thumb.

Maurice Merleau-Ponty, as did Edmund Husserl before him, spent time contemplating his hands touching one another. Perhaps when you are an academic sitting most of your life at a desk (scholar's posture) idle hands become philosophical hands, a solid example of the primacy of the deed. He raised the question of how one hand could be experienced as touching the other one and then the touching hand could be reversed. While, to my reading, it appears he didn't think there was a point where both hands are touched and touching at the same time, I think I can experience this simultaneity. Yet his concern was to demonstrate a principle of reversibility, foundational to his phenomenology (he called it "flesh ontology"), and he also asked how these two separate things (left and right hands) could be connected. I've thought lots about this example over the years and I'm not so sure it is such a remarkable example, that is, offering all that much insight. To my present point however I think it illustrates the interdependence of gesture and posture. It also illustrates our ability to consider body parts as objects as well as subjects. Just take a second to extend your hands and have one touch the other. Then at some point reverse the touching and touched hands. Now attempt to have them touch and be touched simultaneously. You will likely have experienced two things. The touching hand tends to move more relative to the touched hand because touching is moving, gesturing; moving is agentive and active. You also likely placed the touching hand above the touched hand. Agency, as a sense of action (thus moving) on the environment, complies with the corporeal concept of superior, thus taking a position above. The touching hand is more likely experienced as a bit more subject, the touched hand as object. And there's a good chance that when you attempted to experience equal touch/touching you held the hands with fingers upright and moved both hands equally. You might have used a kind of

hand washing rotational moving. This demonstrates that sensory activity is often associated with gestural moving. This is a characteristic of agency, to affect the world you must move. To touch you must also move to activate both exteroceptors in the skin and the interoceptive proprioceptors. These relative hand movements would be impossible were it not for posture as I am presenting it as related to the core-based composition of the complex organism. The relationship between gesture and posture allows the objectification of body parts (hands in this example) and the direction of these objects to move relative to one another. Yet as the right hand is separate from the left and each, at once, experiences a different sensation, they nonetheless are both my hands, they both are of the whole body I experience as me, and the feelings experienced by both are my feelings. A core experience.

Posture and gesture are a bit like nut and bolt. Neither would be of much use without the other. Also, like nut and bolt, moving is required for their proper interdependent and relational functioning.

Gesture and Prosthesis

Minimally gesture is self-moving in space in patterns and techniques acquired as a body living in a social, historical, and psychological environment. Often acquired more or less unconsciously by mimetic repetitions of the gestures of others in one's group, gestures enculturate and create identity through shared patterned behaviors. Gesture is a technique of extending oneself into the environment shaping the perceived environment as an extension of the perceiver's body. At once gesture incorporates, literally in making corporeal, the environment into one's being and identity. Gesture is not simply expression; it is agentive and creative to the degree of worlding. Gesture often is the skilled use of tools—body parts or mechanical aids—to extend the body, to perform an action, and to create an effect.

Gesture is then invariably prosthetic. Gesture facilitates the active encounter with the environment, with other, both to magnify the capacities of the body as well as to influence and to be influenced by that beyond the body's physical perimeter. Gesture externalizes thought and will and influence and memory and expression.

Gesture is instrumental. Gesture is the process of making and shaping. Making and shaping have the prosthesis effect of turning the person inside out. Perhaps, as acts of perception, gesture also brings the outside in; Merleau-Ponty's reversal, his chiasm. Gesture—including skill and technique—is prosthesis concretized in language, the arts, architecture, technology, religion, and all social and expressive systems.

Prosthesis and Posture

We come into the world moving. Our earliest movings are gropings. Groping is reaching out in expectation, but without knowing. Groping anticipates contact, encounter, exteriority, other. Groping anticipates without knowing what. It is through a groping encounter with what is not us, that we discover who we are, that we situate ourselves among what is not us. Our groping movings are intertwined with touching. Exteroceptors in the skin sense heat and texture. Proprioceptors, interior sensors in the muscles and joints, sense mass and resistance, location, and the quality of moving. We feel ourselves take shape as we feel the exterior world. Kinesthesia. The encounter reverberates. Self and not-self, interiority and exteriority, encounter via biomechanics with the objective environment all echo like sonar, revealing, or perhaps better, creating the knowledge of self and world, more strongly even, creating self (posture) and world. It is in this encounter that, through the kinesthetic capacity of proprioception, we experience the certainty of the feeling kind of knowing, of the difference between smooth and jerky moving and the baseline gradient spanning from incoherence to coherence. Phenomenolo-

gist Renaud Barbaras wrote in his *Desire and Distance* (2006), "the body is this being that exists in the mode of relationship and comes back to itself—constitutes itself on the basis of its entry into exteriority. The body is a temporal and historical unity that creates itself against what undoes it through a continual movement toward and within exteriority" (144). It is our prosthetic urge, the given need to reach beyond our limitations, that constitutes the shape and feeling of identity as our body reverberates back to itself in the encounter with what's out there.

Gesture Posture Prosthesis Nexus

With the shift from movement, change in place, to emphasizing the dynamics and ongoingness of moving, especially self-moving, the difficulty is in grasping moving in that it is in no place. To grasp is to hold in place, thus dismissing the essential distinction of moving. What I propose as the advantage of this gesture posture prosthesis nexus is that it allows an appreciation of the primacy of moving, but also its very ungraspability. The nexus is relevant to human self-moving in that it offers dynamic parameters and relationships operative to effect moving in its ongingness and to provide a vocabulary for the dynamics and powers of moving in process.

Aristotle's theory of moving, according to Czech philosopher Jan Patočka (1907-1977), is "being-in-act as potential." Patočka, building on Aristotle, states "existence is a mode of being that is *the act of accomplishment of self*—that is its own goal, that through its action returns to self, that is its own act in and next to itself. Existence is thus something like movement, and just as movement, according to Aristotle, is passage from possibility to accomplished actuality, passage that is itself accomplishing, so existence too is *life in possibility*" (Quoted in Barbaras, *Desire*, 144). Surely understanding Patočka's insight would be improved by using the present participle "moving" as better reflecting Aristotle's dynamic understanding.

In his *Gesture and Speech* (1993) André Leroi-Gourhan offered the French term *tâtonnement*, which means trial and error, but also refers to the groping movement of the hand or other body part used as prosthesis. Yet, *tâtonnement* is not simply some random moving, it is, as Leroi-Gourhan understood it, an aspect of gesture and schema and skill. He recognized developmental stages but continuity between the motor programs of groping of the newborn and the later gestural and skill developmental schemas of the apprentice. The importance of this insight is the recognition that as gesture is a prosthetic reaching out to explore exterior, the experience of the encounter is returned in the construction or ongoing modification and refinement of schemas and gestures and even to the shaping of posture. Further, the groping aspect of the gesturing suggests that encounters are not fully known or predictable—a distinctive characteristic of *tâtonnement*—thus these movings are the source of creativity and novelty and growth and knowledge. The term *tâtonnement* also implies the use of a tool or hand to explore, as a physician using a practiced hand to palpate a patient's body. It easily extends to any sense of reaching out to probe or explore.

The bodies—the postural distinction—of musicians, persons accomplished in sports, and dancers are shaped (as are all bodies), often quite noticeably, by the skilled explorations of their movings, by the *tâtonnement* experience. The same person would wind up with a different posture, body structure and mobility capabilities, should she spend a decade training to dance ballet versus the same period training as a break dancer (or an academic!). A dramatic example. Think of the feet of a ballet dancer supporting her weight *en pointe* for hours daily, compared to her feet should she be an academic whose weight is supported principally by her derriere. Our bodies reconstruct themselves to enact the deeds we are.

Popular culture often vilifies repetition as boring, as uncreative, as a waste. And, of course, repetition has plenty

of potential, as most school kids and office workers can attest, to be dull and draining. However, it is impossible to appreciate the power, creativity, and vitality of this gesture posture prosthesis nexus without realizing that repetition is essential to growth, to the acquisition of knowledge, to the accumulation of skill, to creativity, and to the discovery of self and world. And to freedom.

There is something magical about threes. They are at once stable as geometry, yet dynamic as relationships. I think my first sense of deep appreciation of threes occurred in reading Fredrich Schiller's *On the Aesthetic Education of Man* (1795). In twenty-seven letters he developed a relationship between dynamic pairs that in their interplay give rise to a "third thing" or force. For example, he proposed that human beings have what he referred to as a "form drive" (*Formtrieb*) which demands that all experience be reduced to principles (forms); we want to understand everything in well-defined terms. Yet there is also a "sense drive" (*Stofftrieb*) that pushes us to be in the moment, to savor the now. He then suggested that these drives are not in opposition, as might be assumed; rather they coexist, they are copresent, and each both restrains and enables the other. Remarkably, he proposed that when the two urges or drives are in concert—dynamically engaging one another—a third drive arises which he called play (*Spieltrieb*). The seeds that led to my current efforts to appreciate and articulate human distinctiveness in the remarkable structurality I call aesthetic of impossibles were sown by Schiller.

Years later I became thrilled by Charles Sanders Peirce's account of discovery and the development of knowledge. While the scientific method is built on the rational processes of induction and deduction, Peirce, who in his youth had read Schiller, argued that a third thing, which he called "abduction," was essential. This third thing proceeded from the experience of surprise, that is, incoherence, and led to the rise of hypothesis. Late in his life Peirce referred to this third thing as play. Peirce's

induction/deduction/abduction nexus was similar to Schiller's form/sense/play nexus. Both were conceived as more a triangular relationship among pairs, a nexus, rather than a linear progression. Both, as I have come to understand them, envisioned pairs of copresent impossibles whose interactions, not their resolution, accounts for the force of life.

Then along the way I became beguiled by phenomenologist Maurice Merleau-Ponty's flesh ontology. It recast perception by replacing a representational understanding with a complex chiasmatic copresence of impossibles that understood perception in relational terms. Merleau-Ponty foregrounded touching and moving and the reversibilities of touching and being touched and the exchange of outside and inside—applicable between body and environment as well as body surface and depth—essential to perception as well as the felt unquestionable sense of self. Merleau-Ponty's *flesh* was something of a third thing as well, occurring in the dynamic interplay of perceivable/perceptible, self/other, and akin to my imagining of an aesthetic of impossibles. Merleau-Ponty understood this dynamic he called flesh as so foundational he referred to it using such terms as "an 'element' of Being" (*Visible*, 139), "an ultimate notion" (*Visible*, 140), "the ultimate truth" (*Visible*, 155).

What I suggest by proposing this nexus is that there are three things—gesture posture prosthesis—and that engaging them in pairs gives rise to an interplay that invariably demands self-moving as the force that drives the nexus. Gesture and posture considered together demand prosthesis and so on. The nexus is one of interplay, and that implicates that it is also one of moving, of ongoingness, of vitality.

Vitruvian Man

Among the most distinctive and recognizable of all images is Leonardo da Vinci's Vitruvian Man drawn around 1490.

It depicts a man with two superimposed postures one with the legs together and arms extended horizontally, the other with legs spread and arms slightly raised so the fingers are at the same elevation as the top of the head. The figure is inscribed in both a square and a circle with the feet and extended fingers in contact with these geometrical shapes. This drawing in named for the ancient Roman architect Marcus Vitruvius Pollio who described such a figure in Book III of his *De architectura*, the first known book on architecture written 30 to 15 BCE. Vitruvius wrote extensively of many proportions of the male (of course!) human body and how these proportions apply to architecture. Some proportions approximate the famed Fibonacci ratio. Da Vinci understood the drawing as demonstrating that the proportions of the human body are those of the universe. The use of geometrical shapes foreshadowed Johannes Kepler's (1571-1630) theory of harmony—building on both Pythagoras's (570-500/490 BCE) theory of harmony and Copernicus's (1473-1543) shifting to a solar center of the universe—published in 1619 in his *The Harmony of the World*, in which he illustrated the harmonic principles of the solar system by inscribing geometric shapes one inside of another.

Among the many ways of appreciating Vitruvian Man, I suggest that it might reflect something of the dynamics of self-moving, glimpsed in a still image, in terms of the gesture posture prosthesis nexus. Da Vinci presents the ideal man [sic] with exacting proportions, that is, with posture that correlates with the fundamental geometrical shapes, the square and circle. The man has outstretched arms and legs in two positions, indicating range of motion, giving a sense of the self-moving potential of the man. Located on a circle, the Vitruvian Man suggests the moving in an arc as suggested by Michel Serres' description of walking. This man is made for walking, for moving his arms and legs, for gesturing. The inspiration of the ancient text of Vitruvius on the proportions of the human male body

and the application of these proportions to the principles of architecture as well as the correlation of the figure with geometrical shapes extends the proportions of the human body to the proportions of the whole universe. The Vitruvian Man is Prosthetic Man, echoing the principles, attributed at that time to God's creation, of the entirety of the universe as well as the principles of the most magnificent of human makings, the buildings that illustrate human creativity and agency. These echoes reverberate with the prosthetic extension beyond the human body in acts of making. What the gesture posture prosthesis nexus allows when framing the fixed image of Vitruvian Man is a glimpse of the full ongoing dynamics of self-moving.

19

Corporeal Concepts

Concepts are something that we generally feel to be abstract principles, often formally stated, that are extracted from the living world. We think of them as rather heady things. Things we might struggle to learn in a classroom or from a textbook. Things that, should we be able to finally understand them, help us comprehend the principled way the world works. The common dictionary definition of the noun concept is "something conceived in the mind, thought, notion."

Taking as radical as possible the primacy of self-moving and the inherent bodied wholeness of animate organisms, I suggest that there is much to be gained by questioning the mind-based understanding of concept. A clue to the alternative I offer is right there in the dictionary definition. I wonder how we can comprehend, make sense of this definition. It seems that we must come to the definition with at least an understanding of the word "conceived." When we look up the definition of this word we find "to become pregnant with (young), to cause to begin, originate." To rephrase the dictionary definition "a concept is something birthed from a pregnant mind." Isn't it fascinating that a thing so abstract and heady, derives from the most bodied of experiences getting pregnant and giving birth? When we look up the word "thought," it is described as "an idea or opinion produced by thinking occurring suddenly in the mind." We cannot comprehend thought unless we already know the concepts "produce," "sudden," and "in," all thoroughly based in bodied experience. Now my observation shifts. While we think of

concepts as airy mental abstractions that come somehow whole cloth from mind, implying that the body is not involved, I submit that we can't even comprehend the concept we label "concept" without already holding concepts such as pregnancy, birth, production, sudden, or even the simple in/out. And clearly all these words designate experiences, thus fully bodied, inseparable from our whole self-moving animate organism. An interesting challenge: state a definition of concept that does not depend in any way on a prior understanding of bodied experience.

Philosopher Maxine Sheets-Johnstone wrote an article supporting her contention that *in* is the first concept we learn after birth and yet it is a concept that is an experiential kind of knowing rather than some abstraction somehow appearing in the mind. I'd suggest that the concept *in* is always paired with *out*. Yet, when we reflect on the most common experience of the newborn, we can't help but recognize that discerning encounters with the world are focused on mouth and hands, on sucking and groping and grasping. The world at birth is comprised of actions and reactions related to what is in and out. The concepts *in* and *out* are not abstractions that somehow exist in the infant's mind apart from body. Nor is it an abstract principle that some adult, likely the mother, must teach to the infant that it learn to put the mom's nipple in its mouth. Our bodies, I argue, can be considered as comprised of concepts inseparable from common experience. The concepts reside not in some abstract virtual sphere we term "mind." They come to exist in the whole body comprised of toned and ever refined muscle and joint sensors and in the synaptic criteria that bear the neurological programming that allows us to move our bodies in the patterns that support our lives and effect our interests, that create and discover our world as we encounter it.

Evolution of the human body privileges upright posture, face-forward motility, hands that grasp, and so on. Thus, concepts such as up/down, forward/backward,

above/below, in front/behind, grasp/release, and so on are all born of and borne by the self-moving body and dependent on its distinctly evolved biology. Concepts correlate with posture. All these corporeal concepts, as we might call them, and so many more, are fundamental orientational and basic bodied relationalities that can be used in abstract ways. We *rise* in our professional field. We *backslide* in our religion. We have many employees *under* us. We *grasp* the significance of love. Alternatively, imagine ourselves as Janus structures with faces in opposing directions and (can we even conceive it?) biology of motility that is equally agile in both facing directions. What sort of arms and legs would we have? What would our shoes look like? Forward and backward wouldn't have any distinction. How would we describe or comprehend the passing of time? How would we sit? How would we even move to a destination? Our most fundamental concepts would be entirely different. Our world, our language, our concepts, our sense of self, would all be ontologically different.

Linguists and philosophers George Lakoff and Mark Johnson published a seminal work *Metaphors we Live By* in 1980. They demonstrated that language, indeed, most everything we utter, is based in metaphor, often embedded in the history of the words themselves. Metaphor is a language trope by which we understand one thing, often a seemingly abstract notion or idea or concept, by equating it with another thing, a solid bodied experience, knowing full well that these are not really the same at all. What their work convincingly shows is that the process of gaining knowledge and understanding of those things we normally consider abstract, mental, and nonmaterial is invariably deeply dependent on bodied experience, indeed, specifically human bodied experience. Metaphor is also an excellent example of an aesthetic of impossibles.

Lakoff joined by mathematician Rafael E. Núñez in their 2000 book *Where Mathematics Comes From* test this claim of the corporeality of concepts on mathematics widely held

to be the most abstract constructs and concepts known, including so-called pure mathematics that allows any propositions imaginable, for example, defining a straight line as a line crossing itself in one point. They tested such mathematical concepts as infinity and irrational numbers like Pi and the square root of two, which by their very nature cannot be precisely quantified. In their long, detailed, and fascinating book, they show convincingly that the mathematical constructs that seem the most abstract and that seem to defy any material connection are all, when pushed to their roots, dependent on the bodied experience of the self-moving animate organism.

Of course, we all learn formal mental concepts. School focuses on such styles of learning. Such learning is valuable and important. Such mental concepts can be precisely stated, quantified, informationalized, objectified, reasoned, and most certainly applied to the real material world to help us gain understanding and insight. They are key to building bridges and buildings and calculating trajectories to Mars. Yet, it is unquestionable that none of these are literally conceived and birthed in some mental world, separate and isolated from the self-moving quotidian body. We are not divided into mind and body (sorry René); we are bodies that require brains and all the other juicy parts necessary to our every action and awareness.

Stated even more radically in a way I'm rather fond of, we should consider ourselves, our very bodies, as comprised of concepts that permeate our every moving experience and action. We are comprised of corporeal concepts. Our moving bodies are our concepts, our concepts are our moving bodies.[21]

---

[21] My mentor of fifty years, the late Jonathan Z. Smith, proclaimed that an academic must be relentlessly self-reflective since the theory adopted at the outset of a study largely determines the outcome. It is common in academia, and I suppose also in life, to select the concepts on which we chose to build our understanding of reality. In the sciences, what Thomas Kuhn (1922-1966) referred to in his 1962

book *The Structure of Scientific Revolutions* as "normal science" is the day-to-day science in which inquiry proceeds based on the embrace of a body of theory, an initial set of concepts. In religious communities, early in life, one, often in a formal ritual process, embraces the basic principles by which life is to be lived and values are to be discerned. Creeds are written and frequently repeated as reinforcement of these embraced concepts. Yet, in science, as Peirce and others have shown, hypotheses and theories do not simply appear in the mind, they are the best guesses that emerge from the experience of surprise, a bodied feeling that leads to a bodied sense of potential coherence. Further the very thinking and statement of concepts is utterly dependent on the experiences of body. Religious principles may have a millennia-long heritage, yet most are explicitly based on a richly bodied event such as crucifixion and bodily resurrection. What could be less abstract than ritual murder and the impossible emptiness of a tomb?

What I am suggesting as essential, what I consider to be a major revision, is that we recognize that even as concepts, born of bodied experience, over time come to be abstracted and formalized in creeds and theories and hypotheses, they ultimately are corporeally based and it is this base that, first, allows them even in their abstracted sense to apply to real life, and, second, for them to be understood even by those who hold different foundational concepts, because of the commonness of the human biological distinction of building concepts on the experience of the human body. Tradition, that is the relatedness that unfolds over time in a lineage of bodied experiences, is the ongoing formation, application, and revision as demanded by experience of the codification of what constitutes the shared identity.

The bottom line is that no matter that concepts are commonly considered to be seeming abstract and things of mind, they are always, and most fundamentally, corporeal. The shift I believe will contribute to our experience is to constantly pursue the corporeal base of those concepts we hold, often tacitly so, or are considering embracing.

20

Perception

It is movement itself that perceives!
Renaud Barbaras

Movement is the generative source of
our primal sense of aliveness and of
our primal capacity for sense-making.
Renaud Barbaras

Colorado is my home. I am fortunate to live in a house with an expansive Rocky Mountain vista. Growing up in Kansas amidst the endless Great Plains I felt the views to be vast and fascinating and beautiful in their subtle monochromacy, amber waves of grain. Now, sitting in my study all I need do is lift my head and I see mountains, some snow-covered year-round, foothills, houses mostly rooftops, sky with clouds and occasional birds, a couple of little lakes with landlocked pelicans this time of year, and a traffic light blinking spots of color, an insulting incongruity against the amazing background of the iconic Flatirons above Boulder. I can name a few of the mountains and recall experiences I've had camping, hiking, and mountain biking in those places. I can see Boulder Valley the home of the University of Colorado where I taught for thirty-five years. I can see the area in the foothills where I built and lived in a dome house for many years, later burnt in a forest fire. Pre-dawn many times I've photographed the winter full moonset marveling at how it moves during the season from north of Longs Peak to south of Arapaho Basin. In the summer I can photograph the full moon from a bedroom or walk a few steps to catch it rising red with its reflection in a lake.

Sometimes amidst my awe and wonder of this world, I can't help but muse about something else that engages me with unfathomable mystery. Here I am, one tiny organic being amidst this vastness, yet unlike all that I can perceive as comprising existence, I'm the only kind of thing that can perceive and wonder at not only what I perceive, but also at the very actions and feelings of perceiving. In all the universe, I know of no other things of any kind that hold claim to such a marvel. The awareness of a sense of having the capacity to sense, a common sense or coenesthesia, is distinctive to us humans. All animate organisms, as sentient beings, sense their worlds. Yet humans are distinguished among our kin in our affinity for being aware of being sentient and reflecting on it. We have a common sense that we have senses, and we may objectify the whole process to wonder at it.

How do I perceive Longs Peak or Arapaho Basin or a pelican or clouds? How do I distinguish the bookshelf across the room from the nearby wall and window? How do I immediately spot a favorite book on the shelf full of books? How do I identify a photograph across the room of my granddaughter, Fatu, when it is a canvas print in sepia tones and how do I know that it is a photograph and not actually her? How do I distinguish her presence of a picture from the presence of Fatu herself? I can look at the picture and say "there's Fatu" yet I know that she's in North Hollywood, not here. She's here but she's also not here. Oh my! All this, and I haven't even gotten up from where I'm sitting and it is my moving, I'll argue, that is essential to my explorations.

From where I sit, should I point my camera in the direction of this whole collection of perceivables, it does not distinguish which specific objects to record (the camera's wannabe equivalent of perception?). To the camera the data recorded on each pixel (all forty-two million of them crammed on a a postage-stamp sized sensor) has its own light values yet none are any more

important to the camera than any others. Indeed, that's its distinction. To my camera an image of a Kansas plain has the same number of pixels, each to the camera of the same importance, as an image of my Colorado mountains. The camera has no sense of the picture nor of what effect each of its millions of pixels contributes to the picture. It has algorithms to find the subject or sense light values and many other things, yet it does not know it is doing so. I cannot see my environment like my camera does even if I try my very best. The camera "sees" in some sense, but I *experience and perceive and know what I see* and cannot not do so. Certain things (objects and places, colors and textures) just jump out and shout their identities (generic and/or properly named). My eye is drawn to specific areas and objects including all the senses rather than only sight. Human perception is not like the objective recordings of mechanical devices, a five-track sense recorder. The difference is crucial evidence that I, as all humans, come disposed to perceive my surroundings as comprised of objects I recognize, that is, objects that in some sense, I already know. Humans are perceiving knowing experiencing animals, pattern discerning animals, reflecting animals. Perception requires prior experience and a sense of expectation and anticipation. Perception, beyond the camera's objective recording of data, is interactive and experiential, thus subjective and distinctly felt to be mine.

A classic theory of perception is based on the *camera obscura* or "dark chamber" model and our banal experience and common language of perception tends to support it. This is the representational view of perception that considers it, as with the camera, a mostly objective gathering by the various sense organs of the data in the world projecting them onto a screen within us like images on a wall, stored it would seem by the brain as on a memory chip. A major shift in theories of perception—perhaps made most notably by Maurice Merleau-Ponty mid-twentieth century yet also by other philosophers—sought to replace

the representational view with one that imagines perception as action and encounter and recognition. Once the *camera obscura* representational model of perception is dumped, exploring perception as creative and interactive quickly raises the deepest and most complex, profound, elusive, fascinating questions leading to insights related to what distinguishes being human. What were clear distinctions—visible and the invisible, external and internal, mind and body, self and other—become facets of blurred categories and a mingled body. Perception reveals complicated dynamic systems, structuralities, play, "body without organs," "body without images," flesh and mucous, chiasm, reversibility, seduction, images and ideas that project us beyond the simple substances and patterns into a contemplation of dimensions of perception that transcend the easily graspable as we seek to comprehend what fuels the concretions of our existence. Every scientific advance has philosophical implications. Every philosophical idea suggests new scientific inquiry. We must look anew at the complex interactivity of sense organs and brain processing. Synesthesia—the intertwining of the senses, or better a networking of senses beyond separate modes—is now more important and interesting, at least for offering insight into the nature of being human, than are studies of senses independently. And forgotten or overlooked or unknown senses such as proprioception/kinesthesia (moving) play new roles beyond fifth business.

Aristotle identified moving as inseparable from life itself. Moving plays little part in the *camera obscura* representtational understanding of perception. While at the end of his life Merleau-Ponty appeared in his explorations of perception to be shifting from a visualist prominence to increasingly appreciate the fundamental importance of moving, it has been Renaud Barbaras—building on the philosophies of Edmund Husserl, Maurice Merleau-Ponty, and the Czech philosopher Jan Patočka—who has much more explicitly appreciated the inseparability of moving and

perception as evident in numerous articles and especially in his 2005 *Desire and Distance: Introduction to a Phenomenology of Perception*. He couldn't be clearer.

> 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 [moving] 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 (*Desire*, 91-2, italic in original).

Barbaras notes the obvious that "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*" (*Desire* 86, italics in original). He essentially restates Husserl's term "animate organism." The word "animate" once meant "sensation" and animals are "sentient," that is, self-moving creatures able to perceive and feel. The Latin root of animate links breathing, sensation, perception, moving, and living. Perception is experience, the experience we know as the feeling presence of now. Perception is the aspect of experience that gives it content. As I'll soon discuss related to Ganzfeld, we do not experience nothing. There is no experience without experiencing something. The content of our experience is, or is dependent on, that which we are aware or are in the presence of. This content gives explicit features to our identity; thus, perception is worlding as it is also individ-

ualizing. Perception is not a figment of imagination, a virtual psychological construct. Perception is of our environment, our world, our selves. It is intimate. Our actions of perceiving are accompanied by a strong felt conviction that what I perceive is real (*esse est percepi*) as distinct from imaginary or virtual, despite at some level knowing that appearance and brute reality are not the same at all.

Perception arises in the gap between us and the world in which we live. Self-moving, according to Barbaras, occurs due to this inherent negativity, this 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. Yet, perceiving is a creative interactive process, that mingles self and other, subjective and objective. While we can certainly exercise our imaginations, we cannot imagine anything that is not in some way linked to perceivables. Perception is a felt and owned experience. I know that I exist because I feel and I know that I am perceiving things in the world beyond me, indeed, even perceiving myself as an object in the world.

Early in the twentieth century Henri Bergson discussed "pure perception," the sort of perception that does not rely on prior experience or encounter with the external. Pure perception, as I understand it, is perception before there is anything to perceive. The Ganzfeld (total field) experiments, first done in the 1920s, tried to actualize something like perception before there is anything to perceive. For periods of time subjects were placed in isolation with their eyes covered with devices resembling half ping pong balls illuminated by total spectrum light. They heard white noise added to quell hallucinations that occurred when the subject heard nothing. The subjects were asked to describe their perceptual experience. Most indicated that they soon could not determine if their eyes were open or closed. Many felt fatigue and a lightness of body. Following the experiment,

they suffered reduced motor coordination and a loss of balance. Dizziness or feeling intoxicated were reported. Typical was a temporary state of depersonalization. As Brian Massumi reflects on these results, "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, but they also prevent experience from holding onto itself" (*Parables*, 145). At this limit, perception never becomes action and thus there is no world, no self.

It is evident then that perception is an action performed by individuals, not always with identifiable intention, shaped by their own histories of experience. Perception differs from what we might call "sensation" or "raw sensation," the pre-valued information that presents itself to and is gathered by our various sense organs. The biology and health of the sensing organs both limits and shapes these sensations. Perception is the result of the evaluation and processing of this raw sensory data. In this regard, we must acknowledge that perception is, perhaps contrary to our common understanding, largely *recognition*, acknowledging patterns whose profiles are continually under formation and refinement. We somehow already know what it is we will perceive at least in some generalized sense. Recognition requires that over time our brains, complemented by the function of sense organs including proprioceptors, build neurological profiles and neuronal networks of related profiles that engage sensation data to direct attention to (our attention is drawn to) specific objects that are already known to us. Whereas there is arguably a continuous field of possible perceivable objects, only some seem to leap out of this otherwise amorphous background. These objects are ones about which we have experience, for which we have profiles. Here experience takes on its cumulative implication, surpassing the sense of experience as nowness and presence. This understanding of experience is what we reference in applying for a job. This

experience accumulates profiles of percievables that are constantly modified and enriched across time as we have more and more varied perceptual experiences. Thus, I perceive Longs Peak in morning and evening light, in winter and summer, from my house but also from sixty miles north when I take a drive and even from its summit when I hiked there. I experience Longs Peak today and on many other days over the last forty years. All these specific perceptual experiences present differing sets of raw sensory data, yet I perceive them all as Longs Peak. The profiles correlating with Longs Peak are not projections on a screen in the brain, representations like a photo album. They are ensembles of encounters enriched over time. Henri Bergson's pure perception might be understood as the closest to raw sensation. I suggest that pure perception is perhaps the perception of infants before they have had much experience with focal attention to objects and before they have formed many neuronal object profiles. It is the closest humans come to the Ganzfeld. We can appreciate that, despite its purity and objectivity, such nascent perception is severely limited.

I emphasize that perception is not a recording at all, it is an action that constructs interconnections among profiles (neuronal groupings) built and constantly modified through experience and the sensations objectively connected to the environment registered by our various sense organs. I have shown that concepts are basically corporeal, that is, based in the particulars of the homology and biology distinctive of human bodies. Perception has a similar dependence on human biological distinctiveness. Were our senses and sense organs and brains different we would perceive an entirely different world. Had we more than a dozen types of photoreceptors, as does the Mantis scrimp for example, we would see colors we humans cannot even imagine. Were our brains incapable of building profiles and negotiating these profiles in the encounter with sense data, we would experience a different world, one absent of objects and

distinctions. Neuroscientist Alain Berthoz wrote extensively, in his 2000 *The Brain's Sense of Movement*, on the capacity of the human brain to anticipate, with sophistication, the future; perception requires anticipation.

Time is an essential element in perception. Henri Bergson's pure perception is the liminal position where perception does not, or just barely, exceeds raw sensation. It requires no duration, Bergson's term for the reaction's delay necessary for the action of perception to occur. Following Bergson's observation, Renaud Barbaras wrote that "if immediate reaction corresponds to an absence of perception, *it can be inferred that perception originates in the reaction's delay*. A more complex organism perceives to the exact degree to which the reaction does not immediately follow the stimulus, to the degree to which it can be delayed" (Barbaras, *Desire*, 90, italics in original). Bergson's duration, what I clumsily call "fat present," is that flowing time interval that succeeds the stimulus, the detection by the senses of raw sensation information. Bergson writes, "It is this inscription in duration, insofar as it allows the intervention of memory, that accounts for the properly subjective dimension of perception, a dimension that is understood ultimately in rather a classic way as the *recognition* of what is given in the actuality of the action. Recognition is defined as the act by which recollections involve a current perception and the difficulty is understanding how recollecttions that are of a purely spiritual [he refers here to a rejected view of the brain independently producing images of reality] order can coincide with the only thing of which the brain is capable: movements [movings]" (quoted in Barbaras, *Desire*, 103-4, italics in original). What occurs, and essentially so, in this duration is not a glitch, inefficiency, or failure. It is what constitutes the richness of human perception. It involves the remarkably complex monitored and regulated integration of multiple channels of sensory information. We perceive the world whole, not as a set of separate sensory streams or tracks. Perception involves the

negotiative and comparative neurological process of locating potentially appropriate profiles or networks of profiles, evaluating the variables of the profiles in the creation of an emerging perception. The action of perception involves revisions to the profiles to enrich and codify some and eliminate others, accomplished, according to neuroscientist Joseph LeDoux, by modifications of relevant synaptic criteria. The duration, the length of time constituting reaction's delay, is brief, fractions of a second, but in neurological time it is significant. Typically, we do not notice any delay in our ongoing perception. It seems instantaneous and uninterruptedly continuous. Where we may notice the delay is in that situation where we may have a flight reaction that evolution has built to short circuit the complex perception process as necessary to our survival. When hiking we may find ourselves leaping to the side of the trail, only to realize, that what one part of our brain (the amygdala) identifies as a threatening snake triggering the autonomic system to immediately react, is, after the full neurological processes of perception transpire, but a stick. The interval between flight and perception is *reaction's delay*.[22] One might think this delay in perception would cause our experience of perceiving the world to flicker like an old movie as one bundle of raw sensation information follows another to be processed into discrete perceptions. But it might be better imagined that objective or scientific global time flows uniformly forward, yet with a parallel subjective or local continual flow including a constant backward referral in time as required to incorporate memory, object profiles, schemas, experience into the ongoing action of perception. An appropriate analogy is music that, to be heard, requires resonance, a re-sounding,

[22] Reaction's delay is akin to the delay that physicist Benjamin Libet in "Do We Have Free Will?" *Journal of Consciousness Studies* (1999) documented that occurs between the decision to move and the preceding neurological activity. I'll discuss this more fully in the later essay "Making."

a return on itself, an interaction with itself, to constitute the sounds we hear.

Appreciating that perception is necessarily an action that involves the interrelationship of the perceiver and the environment, it is evident that perception is essentially linked to self-moving. As Renaud Barbaras wrote, "Movement is the generative source of our primal sense of aliveness and of our primal capacity for sense-making" (*Desire*, 132). Further, "In truth, it is *movement itself* [moving] that perceives" (*Desire*, 91, italics in original). Feeling, of course, is biologically grounded in the kinesthetic aspect of proprioception, the biological mechanism of sensing self-moving. This conjunction of feeling and moving in the action of perception is remarkable in its inclusion of both self-perception, the perception of our own moving and our own being, as well as the perception of the external world, the environment in which we live. I've argued that one amazing capacity of proprioception is its ability to sense the quality of the virtual aspects of ongoing self-moving. When self-moving is never in any place how can it be measured other than the feeling experience of its ongoingness, often correlated with values associated with coherence/incoherence? As Barbaras notes, perception, feeling, moving are all aspects of the "same mode of living." And that mode distinguishes us as human beings. Yet it might be stronger and more accurate to say they comprise the vital force that is the ongoingness of living. When we think of perception, we commonly focus on the basic five senses, their respective sense organs and how each gathers sensory data and informs the brain. We unfortunately skew toward a representational understanding of perception, that is, the notion that the world is projected onto a brain screen as a representation. When proprioception/kinesthesia is included as a sixth sense, we unfortunately tend to limit its value to helping us track location of body parts we can't see, to maintaining balance, and to preventing injury. Yet, my

discussion of proprioception and kinesthesia offers a decided enrichment of our understanding of perception.

In my naïve pondering of the wonder of perception, I noted that I experience perceiving specific things that seem to jump out to me. Yet, the agency isn't with the object out there, it is rather with the way I am disposed to interact with my environment. This preparedness includes my attention that, in its sweeping assessment of my surrounds, comes to focus, stopping, grasping, recognizing. This aspect of perception attests to moving as essential to perception. Barbaras wrote, "By virtue of its continuity with perception, attention as a gesture of grasping reveals its motor dimension; insofar as it is also a 'stopping there,' perception implies movement [moving]" (*Desire*, 91).

To distinguish moving from movement, as I've insisted we must do, draws our attention to the seeming impossibility of virtuality, the implication of here and there while never being in any place (here) at all nor ever achieving the seeming destination (there). This structurality of moving is parallel to that of perception. The precondition to perception is separation, Barbaras's negation, of perceiver and perceived. The seeming goal of perception is to close or bridge the gap of separation. Unfortunately, we often assume that perception involves the bringing into us what is outside of us, a representation. We might better suppose perception as the reverse, that is, projection. Yet, perception, like moving, as moving, is neither here nor there, neither inside me nor in the exterior, neither representation nor projection. Perception implicates both a here and a there, an interior (in me) and an exterior (environment, world) but it is never *in* either place. As action it is vital moving that actualizes self and other, person and world, inside and outside, yet as action it is always moving and feeling and living.

Perception is richer yet when, understood as inspired by moving, it is considered as an *aesthetic of impossibles*. I remind, the word "aesthetic" is from Greek *aisthētikos*, from

aisthēta "perceptible things", from *aisthesthai* "perceive." In the late eighteenth century, the word began to shift from relating primarily to perception to being concerned with beauty. I love the idea that the two senses present in the history of this word remain present, if not in our full awareness. Aesthetic then implicates a set of experiences, "I feel, I sense, I perceive, I know." And ain't that a beautiful thing! Perception requires holding together as the same two things that we know are not the same at all. Looking out the window of my study, I perceive Longs Peak. I see Longs Peak. I know Longs Peak. It is right *here*, as my perception. It is *there*, in its rocky mountainy physicality. It is not Arapaho North or Meeker. It is Longs Peak. Yet while I feel confident that I perceive the world—Longs Peak—I know that it is not the world (Longs Peak). I somehow knew it even before I perceived it. Doesn't that mean I created it? Yet I also know that Longs Peak was here long before me (even eons before it had a name) and will remain long after me (even after its name is forgotten). How could I create a mountain? I also know that while I once, years ago, hiked to the summit of Longs Peak, there is no way I will ever really know Longs Peak. As I create it, surely it too creates me, in some sense. Perception—the relationship between me in my study and Longs Peak sixty miles away out my window—requires both here and there, knowing and not knowing, experiencing that is never whole nor complete nor really accurate (if that even makes sense), yet I nonetheless still experience it as whole and complete and accurate and real. I affirm that every morning when I open my bedroom drapes and say "ah, Longs Peak."

Perception can also be thought of in terms of the gesture posture prosthesis nexus, as I have introduced it. Perception is the gestural action of attending to, of recognizing. Perception, as gesture, is anchored in the whole human biology of self-moving that creates and constantly refines memory and profiles and that provides the feeling sense of knowing that is kinesthesia. Perception,

even including the focus of proprioception, involves the creative interaction with the external beyond the body perimeter, even in the Condillacian notion of one's own hand touching one's body. Thus, perception involves prosthesis or transcendence. It is an ongoing interaction that involves time and space. Perception as prosthetic involves engaging the world beyond. Human perception involves the temporal process, a plumping of the now, of engaging information regarding raw sensation in a comparative process of memory and profile selection and modification requiring duration (Bergson's term) observable as reaction's delay. But it also involves the long durée of accumulated experience and the gradual building and modification of profiles which make perception recognition rather than some directly significant sensation. What neither Bergson nor Barbaras do sufficiently, in my view, is to place this action process in this longer timeframe of accumulated experience. I consider this shift the grounding of the gestural action of perception in the bodied distinctive human posture. Bergson referred to pure perception as instant perception unfiltered by what I'm calling profiles and memory. I'd suggest that we best understand pure percep-tion as a baby's first perceptions—or even simpler animal's perceptions—which is the closest to an utterly objective act of perception being uninfluenced by the remarkably complex shaping of profiles related to specific objects perceived colored by experience, variety, emotion, anecdote and so on. Artificial Intelligent imitations of perception are more on the order of pure perception, uninfluenced by the feelings and awareness spanning the continuum of coherence and incoherence or its many identities—pleasure pain, happy sad, confusing clarifying. For AI perception is comprised of a probabilistic algorithm applied to sense data. Human perception is not logic, not based on computation, Human perception is messy, subjective, and often unreliable, yet it enacts our identity and creates a world that seems to us unquestionably real.

21

The Senses

Years ago, I had a golden retriever named Khumbu. He was a beautiful friendly dog that never really stopped being a puppy. I can't comprehend the miracle of his smelling ability. Living in the mountains I would take him to a high meadow near my house and throw a ball so he could enjoy the attribute that distincted 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. Often in the spring the grass would grow as tall as his shoulder. When I threw the ball he'd run in the direction of my throw, yet the grass would keep him from being able to see where it landed. He'd put his nose near the ground and run in a spiraling search pattern. Occasionally, he'd stop pop his head up to locate me then return to his sniffing search until he found the ball. He always did. He was able to find a ball not by seeing it but by smelling his own slobbers 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 home in on it from many feet.

Human evolution fascinates me. Khumbu plays a role. The rough development I have in mind is the branching that separated quadruped and biped. Khumbu, my beloved quadruped evolved with his nose to the ground almost literally. He could run with his nose almost touching the ground, sniffing away. I can't imagine myself being able to move at any speed with my nose to the ground and the image of me even trying, including the sniffing, makes me laugh. Khumbu seemed to be able to smell things under-water 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 and he could only eat (or more accurately snarf) with his mouth. Smell was the dominant sense for him, at the apex of his sensorium. Even when he could see his objective, he relied on his sense of smell. I doubt that Khumbu is unusual among many, if not most, quadrupeds in this respect.

The branch of animals that stand on two legs including humans evolved with different sensory values. Our noses and mouths are far from the ground where food grows or lives and where food is prepared either raw or cooked. We do not stick our mouths and noses into our food to eat. To do so would be criticized as being uncivilized or acting like an animal! Food is delivered to our mouths by our hands with the accompanying smells wafting into our noses just above our mouths. We have hands with which to eat and we have invented eating and cooking utensils, all prosthetics that extend our hands and serve as surrogate teeth in some way to enlarge the features distinctive of our evolution. The mouths and teeth of quadrupedal carnivores are killing instruments. Their procurement of food is a deadly bloody intimate affair. Standing upright, our hunter ancestors relied on hands and arms and their gestural prosthetic extension with spears and clubs as killing instruments. Kitchens with all their tools and dining rooms are hand and teeth prosthetics. There is a significant sensory distinction in relation to food based on posture. Our human ability to smell and most surely also to taste are not as acute as for quadrupeds. Eating is one of the core activities of the anterior region of our upper bodies that seems a privileged zone accompanying bipedal evolution. Vision, hearing, and the micro-movements of the hands, especially the grasping digits, have come to be the sensory locus of our humanity. It is remarkable that while many believe this seeming progression the result of an enlarged brain evidenced by a larger skull, André Leroi-Gourhan and others thought it was the feet that first developed allowing for upright

posture and bipedal motility. My preference is the commonsense idea that the whole organism evolved at once. Feet, larger brains, and grasping hands with opposable thumbs seem to me to have had to coevolve.

The architectures of neuron/synapse, proprioceptor, and general body morphology as designed to engage the world are all architectures shaped by the function of reaching to connect, to touch and be touched, to fill a negative. All these reachings and touchings are inseparable from moving, especially the directed purposefulness of self-moving. The proposition I offer is to consider the philosophy and biology of self-moving, aligned closely with pressure-sensitive touching, rather than the common visualist bias, as essential to comprehending the senses. Moving and touching are typically considered as the lowest of senses associated with the most basic aspects of animal nature. Self-moving and proprioception are usually not even included as senses or thought to be involved in perception. Gesture and posture are also inseparable from moving/touching and thus valuable to our comprehending and appreciating each of the senses and especially how they function synesthetically. The challenge is to offer an alternative to the given (inherited, received) visualist understanding of the senses by appreciating how moving/touching are fundamental.

Seeing, like gesture/posture (as gesture/posture), is an act of skill and experience. We must learn to see through looking practice and experience, looking with the fingers as well as the eyes. It may seem that vision is passive and that seeing just occurs and of course the world is alight. I maintain that we cannot *know* what we are seeing without the experience developed over time through proprioceptively active encounters of repeated touching and moving in conjunction with eyes. These repeated experiences of presence build accumulated experience as neuronal networked profiles. We can have no visual experience—that is, we cannot see discerningly in contrast to simply

being sensitive to light—of anything that we have not already acquired experientially-based knowledge. Neuronal groupings are built through processes of shaping and coordinating synaptic criteria based on touching/moving experience connected with visual stimulation. I take radically the argument that, stated as chiasm, perceiving is moving, moving perceiving. Seeing is an act of skill and experience and practice and, as such, it is simply inseparable from self-moving. Foremost seeing is a comparative act of recognition. Understanding seeing this way allows us to appreciate that the touching/moving proprioceptive experience is biologically retained and available to the coordination processes of neuronal groupings 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, by coherence with neuronal groupings, accumulated experience always ultimately grounded in touching/moving.

The occasion of a visual impression (a raw sensation) that we do not recognize is a sort of pre-seeing, an encounter of an indistinguishable visual field (Gansfeld) before a sensation of a seeing kind. Pre-seeing is perhaps the sort of sight experienced early on by babies. As adults should we want to "see like a baby," we would have to learn to "unsee," if we even could, to comprehend this baby-vision. Pre-seeing is the first visual efforts of the congenitally blind that have gained the biological capacity for sight by surgical procedures. These folks experience a sort of baby-seeing without recognition of what is seen, seeing with little if any knowing, seeing before seeing any *thing*, shifting blotches within a Ganzfeld. Indeed, the blind who have gained sight as adults often are 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 new visual sensations become ones of visually knowing and recognizing objects and actions, that is, that

they proprioceptively—pressure-sensitive moving/touching—learn the skills and build the profiles essential to true seeing. We may comprehend this stage of seeing a bit more by considering those occasions when we visually encounter something that we do not recognize. Typically, we will have the urge to attempt to touch it or to move it around or move around it to discern its edges, its mass, its texture, and so forth so that it might be compared with and placed within the neurological network of profiles our visual knowledge has already proprioceptively acquired so that it might be something we knowingly see. Only then, after touching and moving, can it be seen in the sense of a thing visually known, an experience of recognition.

Taste and smell and hearing occur when objects come in proximity to the tongue and nose and ears and contact taste buds and olfactory organs and cochlea. Taste and smell and hearing have continuity with proprioception, with moving and touching. I've already linked taste and smell with modes of motility. To go further, taste and smell are qualia of the proprioceptive exploration of the world and its accumulating experiential knowledge. As Diane Ackerman put it in her *Natural History of the Senses* (1991), "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'" (7). The proprioceptive connection with these acts of sensing is reflected in the language related to taste and smell. Almost all the taste and smell terms refer either to the effect 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'" (13). Unlike colors, tastes and smells do not have a rich vocabulary of terms that are abstractable from their source. This distinction suggests that taste and smell are more directly associated with proprioceptively-based knowledge, as qualia strongly identified with moving/touching experience connected to the encounter with specific objects. Sound is identified either as the impact on listener—loud, soft, sharp, painful—or as "the sound of" that requires that to properly hear a sound is to recognize it as of something we've previously encountered.

The senses seem incidental and ambient. They seem to just happen to us. Yet the senses are also skilled actions purposefully done with intention and discernment. Think sommelier. To savor we actively engage and assess flavor and odor. One cannot savor without a palette of sensory expectations that is born of accumulated experience. While olfaction may occur automatically with every intake of breath, it is only savoring or actively 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" (5). These detonations involve inhaling a scent or placing something in the mouth or on the tongue, waiting with anticipation the assembling to occur that will deliver, like a dawning, potential identities and associations and values prompted by the raw sensations. Sound too seems a presence in any environment. We have an awareness of a dose of raw sensation yet unidentified, a hint or a blast, and then we have an awareness of processing the sensation to arrive at recognition, identification, implications, affects, reactions, activated memories, and so forth. We recognize the odor/taste/sound: "it is banana," "it is

piñon," "it is the roar of the sea" and we may also have an association with place "it is Bali," "it is Grandma's house," "it is Waikiki," or with an occasion "Thanksgiving." The sensory processing of taste and smell and sound (say a certain salsa song) may continue even to richly storied memories of a love affair in Costa Rica that we had half a century ago accompanied with complex emotions and moments of deep feelings. This common experience of reaction's delay is due to the complex pattern-identifying (and constantly revising) neurological processes initiated by raw sensory data leading to recognition acquired by comparative matching raw sensation to those in networks of neuronal groupings. The senses are impacted by temperature and quantity, and they vary with culture, gender, age, and history.

The etymology of the word "taste" is interesting. The modern use of the word referring to sensation on the tongue is rooted in the word for "to touch, to handle." It also links to a trial or a sample, as in "I'd like a taste of that soup" or metaphorically "I want to have a taste of climbing."

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. It is a story of mystery and intrigue; a story of suffering and exploration; a story of color and sound; indeed, these "senstories" offer insight into how the beauty of the violin's sound is considered by many to be related to the orange color of the varnish on these famed instruments.

Among the many things that fascinate me is the iterative groping process that led to the creation of such amazing instruments. Finlay's story recounts a long process of collecting not only materials but also the knowledge and

experience and skill that eventually manifest in a single object. It is a groping exploratory process of experimentation and iteration. She shows us how each instrument produced is the recipient of the wisdom and accumulated experience of all those that were made before it. I think 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. Such objects are clearly the prosthetic extension of one's hands and body and imagination empowered by other specialized prosthetics, tools. We are aware of this bodied prosthesis even as our minds do not consciously direct the specificities of skilled performance of craft. Rather 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 movings essential to the accomplishment of our creation.

A violin is a tool also, 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 exercised like a racehorse, that is, the violins must be touched and played 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 into simply beautifully shaped chunks of voiceless deadwood. 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 be practiced and exercised to retain their skill and acumen.

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 or telephones perhaps for this sort of tool. Rather, and I think this distinctive of our humanness, this

accumulating skilled making can develop to achieve what we can imagine far surpassing, necessarily prosthetically so, our body's natural 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. As taste and smell enhance one another, surely also do sight and sound. All sensory experience is based in touching/moving; each sense always already transcends itself and intermingles with all the others.

22

Making

Long enthralled by the fiction and film of human makers of sentient beings, I initially considered this making a product of the modern imagination dating from late nineteenth century invention of androids and early twentieth century beginning of robots spurred on by late twentieth century introduction of Artificial Intelligence (AI). I was stunned to realize the presence of these makings in the classic stories of Pygmalion and Galatea, the long history of automata, and the romantic, perhaps pre-modern, literature starting with Mary Shelley's *Frankenstein: A Modern Prometheus* (1818). The current phase of these imaginative makings might be dated to 1993 when mathematician Verner Venge articulated his belief that a time will soon arrive—he called it "singularity"—when made entities that appear to be sentient humans will gain superhuman intelligence and the agency to replicate thus ending the human era. The recent rise of the area of philosophy known as posthumanism has some of its inspiration in this imagined future. I surveyed and reflected on a wide range of these examples for my 2018 book *Religion and Technology into the Future*.

The common connection with religion, largely in a Western context, is that the makers of these sentient beings are usually wealthy white men—quirky nerd types—who see themselves as being considered, or actually becoming, gods when they successfully achieve this feat of making. After all only a god can create sentient beings. Interestingly also, yet perhaps not all that surprising given the historical gender roles in the West, is that most of the first made sentient beings of these fictional makers have been female,

with a goodly number given the name Eve or some variation. Many are beautiful and seductive; the sculpted Galatea seemed to seduce Pygmalion. Even Frankenstein's creature, while male, might be understood as reflecting Mary Shelley's female perspective. It doesn't take much imagination to recognize the present phase of this history. Efforts of wealthy powerful white men aspiring to be gods penetrate the solar system with their phallic shaped rockets at the same time white men are taking away from women Constitutional rights related to sex and reproduction. Men see themselves as godlike, women as their compliant sex toys. Inspired by a number of these female Eves, I constructed a futurist figure I named "Tomorrow's Eve" who offers a shocking perspective on life in the future. Tomorrow's Eve, in my imagining her based on recent examples, kills her maker (Nietzsche's god murderer) as the ultimate act of freedom. We'll see.

Human making correlates with the prosthetic aspect of perception. Perception is a recognition of what is already in the external world. Profiles shaped by extended experience anticipate, based on context of sensation, perceivables in the external world. Perception is action interrelating the brain's anticipations based on experience engaging the information of raw sensation set against the tapestry of the external world. The perceiver and the perceived world come into being, gain identity, through this interaction—an act with implications of creation. Nonbiological making is the manifestation of imagination conceived in and projected from the reservoir of accumulated experience—memory, knowledge, skill, gesture, perceptual profiles. Imagination reformulates what *is* (and has been) into what *is possible* and manifests, via gesture and technique, the imagined into the external world. As a physical (material and behavioral) manifestation of this vital interrelationship, making has a prosthetic function. All making, in some sense, materially reflects and extends the morphology and the sensory faculties of the human body. Shirts have necks, arms,

bodies. Cameras see and have memory. Factory robots have arms and feet. Is it any wonder that AI/robots typically have a form imitating the general human body morphology? There is no surprise that the images of fully sentient beings of the future look, act, feel like, and are often indistinguishable from human bodies. Many display perfect and beautiful bodies. Those more threatening are typically distinguished by being a different color and having odd protrusions on their skulls, the obvious markers of race and deformity. Making is prosthetic. The ultimate making is a sentient indistinguishable from a human being, if sexier.

In some contexts, I prefer the word "making" to the perhaps more formal word "agency," the topic of complex academic discourse in philosophy, psychology, political science, and anthropology. While some in this discourse are concerned about the agency of all animals and even the world itself, the core of the conversation is around the nature of human will, intention, and power to influence or have control over themselves and their world. It is argued that only human persons reflect on and care about their motivations. In political science and law agency is relevant to social and individual controls and freedoms. In anthropology agency is invoked when understanding the roles of individuals, groups, societies—often with concern for the oppressed and disenfranchised, the subaltern—in relationship with one another particularly in terms of power and freedom. In philosophy agency is a way of focusing discourse on the nature of human beings and the changing trajectories of reality. When intention is considered an important distinction of agency, theories of mind inevitably inform discussions of freedom and will.

Likely due to my own pragmatism and preference for phenomenology, I'm usually impatient with theories of mind; they invariably echo the mistake of Descartes. I understand the importance of intention. I understand that our presumed worldview, assuming that we are bifurcated beings comprised of body and mind, creates this most

difficult problem of assessing intension as some internal private hidden state of mind. This issue is hugely relevant in the current political situation where people in high office exert the agency of their power, wealth, and position to commit crimes obvious to all. Yet the law is often limited in exacting accountability because of the inability to determine and prove intention presumed to be internal and unobservable. US law embraces an understanding of agency being related to demonstrable intention. There is a legal difference between running over someone with your car when you did not see them and the same act if done because you intend to kill your neighbor. Both situations demonstrate agency in the baseline criteria of influencing the world, but not in the narrower understanding that requires intention. Legal culpability rests on discerning intention. While I appreciate the importance of including intention in concerns with agency, I wonder about the limitations and skewings of strongly adhering to the Cartesian bifurcation that limits intention to mind. Assessments of intention might be indicated by action as well (how else?); the law acknowledges such. For example, if driver of a car veers off the road to run over a neighbor in his yard and the driver is observed with a mean and threatening look on his face and perhaps shaking his fist, these actions might attest "state of mind" or intention. What fascinates me in this legal quandary is that "state of mind" can never be ascertained apart from the assessment of action, a silent admission of the failure of Descartes, yet with significant legal implications.

The duration or fat present that is essential to perception is relevant to agency. Formally, when applied to action and agency, this process is referred to as the "feedback comparator model of motor control" positing that the brain uses copies of motor commands to generate predictions of the ensuing bodily movings. The brain is adept at paying it forward. Duration is required. Only the input of external sensation can trigger the predictions, even though this has

been a matter of contention since the highly influential (but why, other than a Cartesian predisposition towards minds/brains?) movement experiment conducted by neuroscientist Benjamin Libet in late 1980s. Participants were instructed to initiate a simple and predefined movement when their urge to do so arises. They were monitored so that motor brain activity could be detected. They were asked to watch a clock and indicate when they had decided to initiate the movement, usually a flick of the wrist. Libet discovered that motor brain activity began around a half second before the time the mover indicated the decision to initiate movement which then briefly followed.

This experiment is touted by many scientists and philosophers as documenting what I'd put simply as "my brain made me do it." They argue, how else could this be understood? Clearly my brain initiates the action a half second before I am aware that I have decided to initiate the action. Naïve readings of this experiment lead to legal defenses based on "I didn't intend to commit the crime; my brain made me do it." These actually occur. And it seems to raise issues for the role of intentionality for philosophers considering agency. Libet's experiment has also played an outsized role in discussions of free will, with many holding Libet's experiment as scientific proof that what we think of as will has little to no freedom. I've written extensively on what, to me, is the utter ridiculousness of the ways this experiment has been understood and used. To say that the brain decides or initiates intention as opposed to the person in whose head the brain resides is, to me, utter silliness. It seemingly would depend on understanding the brain as independent from the person and as having both the independent interest in and capacity to make decisions apart from the rest of the body of the person. Even the feedback comparator model of moving, requires something to compare. No need for me to get all powered up to critique the way the experiment has been understood and used. Better to reflect on the duration, the reaction's delay, the fat

present, that Libet's experiment measures. A half second in neurological time is significant. To emphasize reaction's delay may suggest that this half second is empty, simply due to the inefficiency of organic material to effect agency. An empty waiting. Yet the feedback comparator model as well as other evidence of the nervous system's capacity to anticipate and predict—also the thick organic comparative processing involved in perception—suggest that, rather than being empty, the half second is teeming with activity reverberating throughout the organism from the raw sensory apparatus, to proprioceptors, to pain receptors—all involving peripheral nervous system often as well as skeletomuscular and vestibular systems—and the reentrant looping comparative symphony going on in the brain. All this action is followed by the signaling and engagement of the mechanisms of awareness and action. The half second is a pregnant incubation.

Libet's experiment suggests agency occurs in the specific intentional attention on action and results. The subjects in the experiment were told to decide when to engage in a small movement. They focused their attention on the decision and the action. We commonly think of agency in similar terms, as achieving goals or performing determined actions constituting work. I might dig a hole in the garden because I want to plant a flower. I might go to the gym and lift weights because I have a goal to become stronger. The action follows upon explicit focused intention. I might twist a widget on an assembly line because that is my job. As a dancer I've been fascinated by the shift of intention that occurs when learning to dance and building dancing skill. During the early phase—this phase can last a long time—all moving is clumsy because it requires attention on so many moving actions at the same time. "Get the feet first, then add the arms and hands" I so often advised my students. We often focus successively on various actions and effects and when these become skilled actions (synergies), we can engage others. As a dance

teacher I always told my students that when they gained enough skill that their attention was on the whole dance—the composite of all the movements, moves, steps, partner connection, music, rhythm, and style rather than on trying to coordinate each of these individually—they would experience dancing rather than doing steps. I've choreographed and danced choreography and observed choreographed dancing for decades. It remains amazing to me that so much complex coordinated body moving can be done while the attention is on the general flow of the dance, rather than on the details of each movement or what comes next. Indeed, this shift in attention is essential to, and a marvelous effect of, the seamless seemingly effort of skilled moving. Sprezzatura!

We all experience this shift in attention from the specific to the general in the acquisition of any skill—riding a bicycle, driving a car, playing a sport, playing music. I'm amazed by the experience—the feeling—of this shift in attention from the specific to the general. Clearly acting with intention based on skill is moving that has agency. The whole concept of skill seems inseparable from agency. Gesture, akin to skill, can be performed with far less intention and attention. Gesture is often acquired rather unconsciously over time in the processes of enculturation and individuation. We gain and express many of the actions that distinguish aspects of our identities—gender, age, ethnicity, culture, and so on—through mimesis and these gestures become part of our quotidian moving lives. The absence of conscious intention and attention do not, for me, eliminate the agentive force of gesture. Even the most automatic of gestures are inseparable from the ongoing cultural and individual identity formation and enactment process. The key factor for me in the agentive nature of common gesture is that these are not movings natural to the species, but rather are acquired and performed as markers of culture and individuality.

Rooted in the postural distinctions of human morphology, making is the gestural or skill-based action of prosthetically extending human imagination into the world. While making is often done with intention and attention, it should, in my view, also include moving actions that are involved in identity formation and enactment. Making implicates moving, agency, perception, power. And the reversibility as well. Chiasm.

The godlike capacity to make a synth is for me a remarkable act of human creative imagination that engages the most profound and fascinating concerns regarding the distinctiveness of being human. It is a facet of the human capacity to imagine the existence of the gods that can result in their manifestation. It makes wonderful fiction and art, even religion. My reading of posthuman philosophy that is inspired by these ideas of making nonhuman synths, suggest that rather than an interest in human distinctiveness, the concern of this philosophy seems directed more towards how to remove humans from the role that has been the default. It seems to me less a reimagining of humanity and more a strained effort focused on something not human in the making, "post." Such a concern is, to me, futile on the one hand (it is humans doing this philosophy) and, on the other, a missed opportunity to explore the remarkable and rare capabilities that distinguish human beings.

23

Emotions

Over the years there is a game I play with my grandkids and, yes, also my university students. Stand in a neutral relaxed position. In a lilting slightly high-pitched voice rapidly say over and over a few times "I'm so happy! I'm having so much fun." Take note of how you feel, the shift in your posture, and how you want to move. Now in a monotonal slightly lower-pitched voice slowly say a few times, "I'm so sad. I don't feel well." Take the same notes. Now, hunch your shoulders and drop your head and let your arms hang long and heavy and say the first "I am happy" phrase a few times. Note what you feel, what posture your body seeks, how you want to move. Finally, lift your head, raise your arms, hop and spin around while you say, or try to say in a slow low voice, "I'm so sad. I don't feel well," and don't you dare smile! What do you experience?

I have discussed the kinesthetic aspect of proprioception, that is, our biological capacity to feel the quality of our movings. The feelings I've focused on, to this point, are those that correlate with a range of qualities of the moving itself, such as smoothness and jerkiness. Importantly, these qualities of moving are inseparable from the evolved biological strategy to produce efficient moving as necessary for survival. What is remarkable to me, as I've pointed out, is that these experienced qualities of the moving itself offer the experiential baseline, a standard if you will, for the subjective measures and valuations of coherence and incoherence, of health and vitality, generally. They ground in the felt kind of bodied self-moving knowing, the pervasive concept nexus of coherence/ incoherence. I'll

always feel this biology and the way it has developed in human beings is some sort of miracle.

Yet, miracle on miracle, our feelings connected with moving are also more than of the qualities of moving itself. There are those feelings we commonly call emotions. The word emotion dates from mid 16th century (denoting a public disturbance): from Middle French emotion (modern French *émotion*), from *émouvoir* ("excite") based on Latin *ēmōtus*, past participle of *ēmoveō* ("to move out, move away, remove, stir up, irritate"), from *ē-* ("out") (variant of *ex-*), and *moveō* ("move"). The current psychological sense of the word dates from the early 19th century. The root meaning of emotion as "to move out" correlates with our banal sense that these feelings originate in the inner body and "move out" to reside in postures and gestures. This root sense of the word also suggests that emotions effect behavior, the feelings moving out into the world as action and gesture. I'd suggest, as evident in the little games I described above, that emotions also involve a two-directional process from inside to outside, but also outside to inside. Encounters with the world are often the root cause of emotions. Emotions show the reversibility of inner senses and gestural moving and posture. Emotions also implicate distance, separation, incongruity rising from the moving process of negotiating incoherence and overcoming separation; neither wholly achievable.

There are many theories and ways of identifying and labeling emotions, yet these are modern concerns beginning late nineteenth century with the rise of modernity and the social sciences, closely connected with psychology, yet many fields of medicine, science, and social sciences also study emotions. It is common today for most of us to notice the emotions we experience and to act to avoid some and promote others. My concern is with how we know the welcome ones from the troubling ones. There is a large professional and self-help industry that serves contemporary emotional health. Persistent pandemic-related emo-

tion management needs as well as those born of the challenges of the high stress modern highly polarized society are extensive. There is currently a high demand for psychiatrists, psychologists, psychotherapists, counselors, and life coaches. In contrast, in my parents' generation (mid-twentieth century) most folks (especially poorly educated rural ones, as were my parents) simply and quietly managed and mostly ignored their emotions. Few among the folk, in that era, were even aware there were professionals who dealt with emotional health. I well remember my mother often scoffing at psychology which she believed attributed any lack of well-being to it being, in her terms, "just in my head," which to her meant not real. Some irony there. And, of course, the history of therapeutic psychology, the treatment of mental illness, has struggled and failed to find equal footing with the rest of medicine. When I was a kid, schools had guidance counselors who simply helped students select courses and develop academic records and grades needed to gain college entrance or get a job. They also dealt with behavior problems. Now schools hire professional counselors to quell the common fears children hold of being murdered by a long gun and to spot those who might become school shooters.

As psychology developed and eventually became common and more accepted, the scientific and professional attention to emotions has been extensive, yet, despite many theories about what causes and triggers (what a horrible word!) emotions and how to manage them has yet to reach much consensus. It is generally held that emotions are mental states brought on by neurophysiological changes, variously associated with thoughts, feelings, behavioral responses, and degrees of pleasure or displeasure. Emotions are akin to mood, temperament, personality, disposition, and creativity. In simple terms emotions are understood as strong feelings deriving from one's circumstances, mood, or relationships with others. In the effort to classify emotions, some identify four basic

emotions: happiness, sadness, fear, and anger, which are differentially associated with three core affects: reward (happiness), punishment (sadness), and stress (fear and anger). Other typologies identify by name and description as many as twenty-seven emotions.

It is essential to appreciate that experienced emotions are impacted by every aspect of the animate organism. Most attention is given to the nervous system and hormones (remarkably from the Greek participle ὀρμῶν, "setting in motion"). Yet clearly emotions are generally understood to be influenced by situational and relational factors, that is, by how one encounters the environment. Nothing can be excluded. Further, endless pathological issues may impact emotions in ways that make other forms of managing emotions ineffective. Still, even the most advanced science finds it daunting to even contemplate an adequate understanding of emotions.

Given these caveats, I suggest that one way, among many, to understand emotions is that they are a second set of feelings separate from, yet still related to, those basic ones born of the quality of the moving itself. This group of feelings arises systemically from the organism in situational encounter. Taking note of emotions, identifying the specificity of emotions, and determining the acceptability of emotions is a process requiring awareness often coupled with learned criteria and terminology. It is common to become aware of emotions, suddenly or gradually, and to identify upon reflection or analysis the environment or situation giving rise to them and to label the emotions felt. We become aware of an emotion as it reaches a threshold of noticeability. Part of acknowledging emotional presence is to identify it: pleasure, anger, grief, and so on. Its identification often includes associating it with a specific situation: loss, argument, award, or threat.

I suggest that the process of identifying emotions uses, to some degree, the baseline experience of the smooth/jerky kinesthetically felt experience of the self-moving body.

The baseline coherence/incoherence nexus is operative in the evaluative process. Most emotions might be arranged along a continuum of incoherence/coherence, for example, anger correlating with incoherence and pleasure with coherence. Love, with all its complexities, is famously characterized as locatable all along this spectrum.

Emotions are also related to the moving body and expressed often in terms of posture and gesture. For example, as the little exercises I outlined at the outset show, sadness and happiness invariably correlate with distinctive styles of moving and posture. Depression, usually understood as an illness rather than an emotion, is associated with sadness and its very name labels a depressed posture and style of moving. Sadness correlates with certain situations of incoherence such as loss and grief. While happiness correlates with certain situations of coherence such as winning and gain and reward. Anger is an emotion that may correlate with the presence of incoherence related to a situation beyond one's control or perceived to be intentionally caused by another. What is key to emotions related to the kinesthetic standard of smooth and jerky moving is that it varies from one individual to another and is usually tied to specific situations also distinctive to an individual. There are strong correlations between the evolved human upright posture, directional motility (forward), and conceptual values corresponding with a vertical axis (up down). Feeling up or forward moving correlates with positive/coherent emotions. Even the upward turn that distinguishes a smile is a gestural correlate.

My argument is, no matter what perspective we take regarding emotions, it is difficult to separate them from the self-moving body, they are feelings after all.

The Cartesian division of mind and body that so shapes contemporary Western life, against the unassailable certainty of kinesthesia, has conditioned us to place, at least in public discourse, the higher value on mind and we associate mind with thought and thought with speech. The

result is that we favor, against our common experience, regarding emotions as mental states and as such our attention tends to center on thought and speech, and consequently the vast industry that helps us manage emotions is focused on talking, on mindfulness, on contemplation, on controlling or calming the mind/ thoughts. There are, of course, notable exceptions and it is not surprising that many of these exceptions are subject to controversy, even dismissal. The undeniable involvement of the self-moving body is often, if perhaps unwisely, ignored as we seek emotional health, which ironically, we often call mental health.

While talk and pharmacological approaches to emotional health are, and likely will remain, predominant, there is good reason to acknowledge that how we move and the gestures and habits we form are powerfully connected with emotions. Through the history of psychology somatic theories of emotion have been regularly accepted and rejected. The first modern version of such theories came from William James in the 1880s. Freud's early twentieth century psychology was strongly grounded in corporeal libidinal concerns. While such approaches were in disfavor through much of the twentieth century, more recently somatic theories have enjoyed a resurgence.

One contributor to this new phase whose research I find especially insightful is 1996 book by neuroscientist Joseph LeDoux, *The Emotional Brain: The Mysterious Underpinnings of Emotional Life*. His research convincingly shows that synaptic criteria are shaped by body behavior. The question is, what causes a synapse, the release of neurotransmitters from an axon to travel to a dendrite receptor of a paired neuron to initiate its action potential (movement of signal across a neuron)? Synapse is a highly complex and varying process to be sure. LeDoux shows, what in a sense can be no other, that the way the body moves itself regularly, those processes of creating efficient and effective movings, programs groups of neurons to

synapse in established patterns (synergies) that have the capacity to anticipate and that endure and are reinforced through repetition over time. We often popularly identify such patterns as "muscle memory," but it might better be referred to as "synaptic criteria conditioning." Once we recognize that emotions are strongly linked, by means of kinesthesia, to gestures, even synergies and postures, we must realize the potential of focusing on moving and posture to promote healthy emotional lives. Such a focus on self-moving would also suggest a different understanding of health itself. Rather than the static place-based ideal that of our common understanding of health, if we foreground the dynamics of self-moving then evaluating health becomes a way of assessing the process of ongoingness, the endless dynamic processes of encounter in the pursuit of fitness, coherence.

Some therapeutic methods based on moving and posture have developed yet remain far less popular than talking or pharmacological ones. Most people know and accept that physical activity has some connection with emotional health. Gyms and fitness facilities often mention the importance of somatic connections to emotional states. While prophylactic efforts to prevent dementia and Alzheimer's often focus on "mind games," the established science indicates that physical exercise is by far the more effective method. I often hear those who dance describe it as healing, a proclamation of which I'm not much of a fan because it suggests that being ill is the normal human condition and that a dominant function of dancing is to treat endemic illness. Despite my personal view, dancing is a challenging form of moving and doubtless has the potential for improving and maintaining emotional as well as physical health (are they separable?). Perhaps that's why I'm drawn to dance every day.

There is no scientific consensus on what emotions are and what causes and changes them, yet there is consensus that emotions are felt, and experienced (necessitating

moving body), and that specifically identifiable emotions are strongly linked to explicit types of moving and posture. Without discounting the importance of talk and pharmacological methods, it is simply common sense that the more we understand and attend to the bodied base of emotions, the greater our potential to understand and creatively manage overall human health and well-being. I prefer to think that it is better to consider the ongoing well-being of the animate organism than to focus on relieving malady or treating illness. Pathology, of course, requires medical attention. It simply makes sense that training ourselves to move with smoothness and grace paired with the developing physiologically healthy posture and gestures will encourage, if not effect, emotional well-being.

I don't doubt that many, perhaps most, animals have feelings and that their quality of feeling is linked with moving. The fact that animals move and have some kinesthetic sensory capacity assures us that they have feelings. For some animals the evidence of emotions is also clear. The wag of a dog's tail, its body posture, and often its barking or growling are obviously linked with what we would think of as happiness or fear or sadness or anger. Those who live with pets are often aware of these animal emotions and their sensitivities to human emotions. The enormous popularity of owning pets is linked with human emotional needs. It is no accident that during the recent pandemic, the demand for pets skyrocketed. Human distinction, among the family of animals, seems to be both in the variety and subtlety of these feelings and in the capacity to objectify emotions, name them, wonder how and why they are felt, and manage them in countless ways.

24

Story

> The stories that made me fall in love with literature in the first place were tales full of beautiful impossibility, which were not true but by being not true told the truth, often more beautifully and memorably than stories that relied on being true.
> Salman Rushdie

Native American author N. Scott Momaday wrote, as I recall, that a people can bear any hardship so long as they can recount it in a story. Indeed, this pertains not only to Native Americans whose suffering has been epic since they encountered Christopher or Leif, but to all folks throughout time. Story is a genre as old as human language. It is impossible to even think of story without including incongruity and conflict, in short, drama. The best stories do not solve incongruities, they reveal how incongruities call forth those most distinctive of human qualities, both the admirable ones and those not so much.

In the early days of my retirement—there is a story as is why I hate that word—I felt compelled to reflect on and to write down some stories from my life. I called it *Dancing Graffiti: Stories from my Life* (2020). I didn't intend it for anyone beyond myself although I self-published a few copies for the fun of it. In reflecting on how I might write these stories I considered various genres such as biography, memoir, diary, and jotted down, in an intro essay titled "Time's Relentless Melt," my sense of how these genres were suited to various situations and what might be appropriate for what I had in mind. I chose story as the best genre because I wanted the freedom to remember and

recreate my life in ways that engaged me, and the struggles and situations encountered that I now think shaped me. I became fascinated by graffiti because of the implications of scratchings on walls both of illegal defacings as well as brief acts attesting a desire to be remembered if by but a scratched name, a tag. The word "graffiti" means scratchings or scribblings, often with the implications of being illegal or done in inappropriate places. I love the ambiguity caught in the phrase "graffiti art." Graffiti is attractive and often colorful and beautiful, yet it is unlawful. I am also enamored that graffiti is often done in secret and anonymously, often created in the cover of darkness, while also being a cry to the ages for acknowledgement. I modified the word "graffiti" with the word "dancing" for several reasons. Much graffiti seems to dance on the walls where painted. I hoped dancing might infuse some ongoing life in my scratchings/defacings and to honor the formative role that dancing and moving has played in my life.

Years after my mother died, during a visit to see my older sister, I learned of a diary my mother had written as a teenager. Torn by the common respect for the privacy of diaries, I hesitated to read it even after her death. Curiosity overcame my hesitancy. Of what I read I remember but one entry. Knowing that my mother's dad died of a heart attack when she was a teen, I was eager to read her reflections. When I found the entry, it was something like this. "Dad died today. Chet [my father whom she was dating at the time] came over this evening." That was it. No sense of loss, no emotion. Just the facts. No story. I haven't been able to get that diary entry out of my mind. It has caused me to reflect on my mother's life and to question if I really knew her. I had heard the stories of her mother's death in a hospital. My mother, then a five-year-old, was called to the death bed to "say goodbye." I recall that my mother loved to tell stories about former events. When she was old, I remember her saying with great delight something like "well that's how it happened and if it didn't, I'm the only one left

so no one can tell it differently." Yet, as a teen, what was her relationship with my grandfather? Did she experience no grief? Was she totally stoic? I desperately need the story I know I'll never hear.

I have been much influenced by the Czech writer Milan Kundera's reflections in his *Testaments Betrayed* (1993) on the story genre we know as the novel. In his discussion of "the invention of humor" Kundera examines the novel *Gargantua and Pantagruel* in four books by the French renaissance writer François Rabelais (c. 1493-1553). Kundera discovers in Book Four a passage that he claims distinguishes the book as becoming "fully and radically a *novel*; that is, *a realm where moral judgement is suspended*." Kundera, importantly, then identifies what for him is a distinctive aspect of the novel genre. "Suspending moral judgement is not the immorality of the novel; it is its *morality*. Morality that stands against the ineradicable human habit of judging instantly, ceaselessly, and everyone; of judging before, and in advance of understanding" (*Testaments Betrayed*, 7, Kundera's emphasis). He excluded from the proper novel those examples that aim to teach a particular moral lesson and those that end with a blueberry muffin, as I call it. Novels succeed, in this sense, to the extent they place their readers precisely in the situation where each seeming route to the moral choice—coherence—gives rise to the further complication of that choice, to yet more incoherence. The play goes on. The dilemma of the proper novel is akin to humor and play and what I'm developing as an aesthetic of impossibles.

Kundera's understanding of the novel as provocatively perpetuating the ongoingness, rather than the resolution or judgement, of the conditions that demand moral choices is, as he shows, akin to humor. Kundera holds that the key to understanding humor is that it "renders ambiguous everything it touches" (*Testaments*, 6). Ambiguity is characterized by the dilemma "Is it this? Is it that?" Both are plausible, both not. Ambiguity is incongruity given a story, the poten-

tial for something as this or that, but with the impossibility of knowing with confidence which. The force of humor is in the delight of the dilemma, the power this incongruity engenders. The acknowledgement is not a reasoned discourse on the ambiguity, it is laughter or a smile.

In common use the word "story" also carries this ambiguity. It may be a bit out of fashion now, but we used to tell our children, "Don't tell stories", that is, don't lie. In the Trump era we have become gesturally naturalized to freely use the word "lie" little remembering how charged the word recently was and how carefully we used it pre-Trump. The word story can mean "lie," but it can also mean the core truth of one's identity. For example, when we tell another "our story" we often consider it an intimate act, the sharing of the private and deeply honest aspects of our lives we think most truly identify us. When, after decades of silence, adults finally reveal childhood abuse, they invariably refer to it as "telling my story." Story is then lie and it is also deepest truth. Often, we don't know which. Some—Rushdie's epigram—have described fiction, itself implicating made up and not factual or real, as constituted by the lies that tell the truth. We don't attempt to resolve the copresence. We recognize that our ongoing attraction to a story, indeed our eagerness to hear it again and again, is that it draws us into this most human of dynamics, the endless interplay of coherence and incoherence, always conjoined with feelings.

Kundera considers that "the removal of the gods from the world is one of the phenomena that characterizes the Modern Era" (*Testaments*, 8), also the era of the novel. The novel is a profane genre, one supposes compared with myth and scripture. Kundera reminds that the word "profane" comes from the Latin *profanum*: the place in front of the temple, that is, outside the temple. The profane is the secular or the non-religious. Kundera provokes by observing that "as laughter invisibly pervades the air of the novel,

profanation by novel is the worst there is. For religion and humor are incompatible" (*Testaments*, 9).

Scripture and myth are genres of stories that are commonly understood as "telling the truth." They establish the center or foundation or first principles on which all truth judgements are subsequently made. Ambiguity, and the sort of stories it inspires, is minimized and consequently so is humor.

I largely concur with Kundera. Religions are renowned for being humorless, stiff-backed, narrow- and literal-minded. Martyrs are those who reject humor at the cost of life. Yet, I would suggest that scripture and myth, the genres of religious stories, are ones that, when held as humorless, are done so based on faith or belief. I argue the essence of faith and belief is the acknowledgement, if usually done tacitly, of the possibility of alternatives. The existence or presence of some "that" held by others over against what I've proclaimed as my "this." If there is no possible ambiguity, no possibility for incoherence, belief and faith would lose what distinguishes them becoming simply universally accepted and uncontested fact. Religious belief and faith may be accompanied by beatific smiles or angry assertions, yet all too rarely (ever?) with a good bawdy laugh at the clever ambiguity of a good joke. Belief and faith are, despite the apparent opposition, at core energized by being an aesthetic of impossibles.

According to my early mentor, Mircea Eliade (1907-1986) myth is the story of the era of the gods recounting how they created the world and those who populate it. As the stories of the gods, they are the very foundation for all truth judgements. The stories of the first or beginning era recount the establishment of an axis about which the world turns and a channel by which humans remain in touch with their gods. For Eliade, human religious life is the persistent effort to live according to the first principles and to return to them when they have been betrayed. This is a humorless understanding of myth and religion that doesn't even allow

humans authorship of the obvious wildly impossibles that characterize myth.

According to my mentor, Johnathan Z. Smith (1938-2017), myth is story made by humans that has its own history. It changes and develops as people attempt to apply the stories to the exigencies of their ongoing lives. This process both guides an ongoing effort identified by those holding a common myth—a tradition—and it includes the ongoing development of the mythology itself as it is engaged in this history of practical application. This is an understanding of myth and religion open to, indeed based on, the creativity of incongruity and the obvious embrace of humor and joke and jest. I much prefer Smith's view of myth and religion.

In popular usage, the word "myth" is perhaps most associated with things thought to be true that are actually false and to a genre of stories from our own antiquity, that is Greek and Roman mythology. It is common to indicate that something is "just a myth" or to dispel something "as but a myth," that is, myth busting. Still, the attraction is the ambiguity. Even false things can appear and be accepted as true. We often continue to embrace our myths even after they have been busted.

Scholars have struggled with whether Christianity can even be considered to have myth because of its fictive implications as well as because of the view that Christianity had distinctive origins incomparable to all other religions. Myth has been, to most of them, more appropriate to "lesser religions," although they have been circumspect with their language. Still, what could be more at the core of Christianity than the stories of Jesus, from birth to crucifixion? And are these not invariably stories of impossibles? And is it not the very copresence of impossibles—virgin birth and bodily resurrection—that accounts for the ongoing fascination with these stories? While scholars have been hesitant to embrace the word "myth" as having any relevance to Christianity, the incontrovertible truth of

origins is widely embraced by practicing Christians who consider God the author of scripture. The current legal leanings in United States courts—as especially obvious in the current US Supreme Court—is the so-called "originalist" view, that is, that the laws as currently understood should adhere to the original language and intent of the founders. It is surely little surprise that the US courts, again especially as obvious in SCOTUS, are closely aligned with white Christian Americans. The courts and humor are, unsurprisingly, utterly incompatible.

In a book I once wrote called *Beyond the Primitive*, I cited an Australian Aboriginal example to illustrate the religious importance of an established center. The example, quoted from a book by Eliade, supported his view including something of an origin story and a striking example of the way Aborigines abided by it. Unfortunately, after my book was published, I learned that Eliade's account that I had quoted was not supported by the published sources he cited. This incongruity demanded from me action and research that spanned years and involved multiple journeys to Australia to visit libraries, archives, and the actual landscape in which this cultural example was set. My goal was to resolve the incongruity and find the truth. Yet as I peeled back the layers from source to source to source seeking the exact words or behaviors of actual Aborigines that I could name and date, I experienced a gradual evaporation of all the details of the example I had originally discussed. My research only expanded the incongruity and raised more questions than it answered. Those questions included: What is religion? What is scholarship? What is human?

With the failure of all my efforts to reconcile, to discover coherence, and to gain closure I turned to discovering and telling a series of stories of many of those renowned figures I had encountered in my research. While these many stories intersected and indeed were energized by encounter, I found that each one deserved my best effort

to tell it from the perspective of those living it. I called this technique "storytracking" which is the title I gave to the 1996 book. Yet, even as I engaged this storytelling process, I realized that it was an effort to resolve the incongruities, even in attempting to tell the stories that unfolded in the drama of the lived incongruity of others. In other words, in the full spirit of postmodernity, I had to acknowledge that my concoction and collection of the stories of others amounted to me also trying to tell my story. Yet, the morality of my work surely had to make no moral judgement, so I included the confessional admission that my scholarship amounted to my effort to find coherence, as much a concoction as a truth telling. In the spirit of the Iroquois woman who, after telling the story of her world being created on the back of a turtle, was asked, "so what supports the turtle," she replied, "it's turtles all the way down," I conclude, "it is stories all the way down. And ain't that glorious?"

The structure we know as story promises support of memory and comprehension. It is difficult to recall facts, but not so difficult if they are elements in a story. As a teacher I learned that students do not respond well to abstract technical descriptions, yet they quickly comprehend if I was able to present the same ideas and information in a story with living examples. As Knowing Humans, *Homo sapiens,* we are constituted in story.

Story shares ontological characteristics with moving. To identify something as story affirms these features. The presence of story is phoneme or word that marks the now of its ongoingness. This presence is at best virtual, constructed of the language and context and memory and expectations in which it is being uttered. In this sense the story, like moving, is never in any place at all; it exists in its moving on. To stop the telling renders nothing; the story goes away. Yet story has a presence, if a virtual one, comprised of its wholeness, its plot, its collection of characters, its arc, its drama. In a sense we know the story,

the whole story, as we know a song by hearing but a couple of notes. Yet, as we know, or have some sense of, the whole story before and during its telling, this knowing does not spoil or obfuscate our eagerness to hear or read it. The ongoingness of story requires a fatness of time in which the present words in their passing engage discourse with the whole of the story and its unfolding, the language of the story, the memories and experiences of the reader of the story, and so much more. Reading or hearing a story is a sort of swimming in this fatty presence that includes all of time and experience. Any moment in a story is rather like entering the TARDIS through the portal of a blue British police call box in "Doctor Who"; it is bigger on the inside.

25

Differently Abled

Many years ago, I lived for a time with Navajo (*Diné*) folks in northern Arizona. I was there to do research for my PhD at the University of Chicago. The focus of my research was prayer, which is important in Navajo religion comprised largely of healing rituals. There is a complex organization of these extensive multi-day and night ritual complexes distinguished largely on the etiology associated with illness. More so than symptoms, the concern is with behavior and relationships among human beings as well as between humans and those figures known as Holy People (*diyin dine'é*). Healing rituals seek to repair relationships more than tending to physiological symptoms. The model for proper order and behavior is based ultimately on the stories of the creation of Navajoland that occurred after a long and complex fraught journey through layered underworlds that culminated in an emergence and the establishment of an enduring order. The larger body of stories is comprised of sagas associated with each of the types of healing rituals familiarly known in English as "ways." These stories tell of heroes who suffer the consequences of testing the given order. These are generally heroic figures, not villains or evil, lauded in a sense because they had the courage to go where no one had gone before often breaking rules in doing so.

I am amazed and intrigued by the Navajo penchant for creating pairings, often ostensibly in some sort of opposetion or complementation, yet through life they comprise a dynamic copresence. These pairings are directional east and west, north and south, above and below, yet most have correlating named figures and mountains and colors and

other attributes. The members of these pairs are at once in opposition and inseparable, copresent. Navajos endlessly compound these dynamic copresences. One copresence calls for a second copresence that is copresent with the first and on and on. A clue to the drive for this endless dynamic is Navajo language. It is highly complex and powerfully verb-oriented reflecting a constantly moving world. Navajos must use remarkable constructions to express immobile, something like "that thing that usually is moving this way or that, is not doing so now."

While it might appear that healing rituals are about restoring the static order of creation, this is not the final concern. A couple of clues offer insight. Present throughout the Navajo creation era was the character Coyote (*ma'ii*, which notably in Navajo means "trotter") who is constantly on the move disrupting as quickly as the *diyin dine'é* can establish something like a stable order. In the beginning creation included a ubiquitous presence of incongruity in the person of a wily frequent disruptor and trespasser. Then there are the heroes who are esteemed because they test the limits. Furthermore, while the healing rituals take place largely in a hogan (house) replicating the hogan where creation took place, a microcosm, the final rite in most of these ritual complexes takes place at sunrise ending the last night. The person being treated (*bik'i nahaghá*, "one sung over") is led out of the hogan a distance to the east to greet the rising sun. This suggests that while a replication of order established by creation has been achieved in the controlled ritual space, life is lived in the dynamic unpredictable world of encounter where congruity and incongruity and non-linearity are always present. Coyotes abound.

I think the exposure to the dynamic moving tapestry of Navajo life has deeply influenced much of what I am still attempting to appreciate and articulate. While it is typical to consider Navajo religion as centered on healing, I think now, after a half century of reflection, it might better be understood as concerned with the negotiating and

influencing the dynamics of the copresence of coherence and incoherence, a dynamic that engenders moving and vitality. There is little attention given to the rectification of physical symptoms of illness as the measure of success for a healing ritual. It is common for a person who is the focus of a healing rite to seek Western medicine as well or to simply continue suffering or just die. None of these situations detracts from the importance of the ritual processes. Perhaps the focus on medicine and healing is, in part, an articulation that came about in the encounter of the *Diné* with other cultures.

The wisdom we might glean from the *Diné* offers insight into our own concerns with not only illness but also with what we commonly identify as disability. I am no hostile critic of Western medicine. I have an adult son who contracted diabetes when he was one year old and he clearly would not have lived, much less for such a long time, without Western medicine. I have myself had atrial fibrillation for decades and two heart attacks, yet I am able to live a vigorous active life, dancing for an hour every day, possible only because of surgery and medication. Still, Western medicine focuses on symptoms as clues to biological etiologies that are then treated to relieve or resolve symptoms. This too is a system based on the dynamics of coherence and incoherence, yet the system is designed largely to identify incoherence (illness) and turn it, as much as possible, into coherence (wellness). We go to the doctor when we don't feel right, when something feels wrong. Physicians assess the causes of what is wrong and engages interventions to make it right (or more tolerable). As an aging adult I sympathize with the inevitable failure of Western medicine. In contrast, what we have referred to as Navajo medicine can succeed even with continuing suffering and even death.

Revisioning illness in terms of the copresence of coherence and incoherence helps us appreciate the differences and complementation of Navajo and Western medi-

cine; perhaps also why one is considered religious/cultural, the other science. This reset reminded me that in much of my thinking and writing about moving bodies, I tacitly presume a "normal" and "healthy" body engaged in "normal" and "healthy" movings. With that revelation I must ask in frank terms, "what about the disabled?" Yes, what about those folks and what on earth do we mean by this commonly used term? The term "disability" dates from the 1570s when it meant "want of power, strength, or ability." In the 1640s it gained the use "incapacity in the eyes of the law." By mid-nineteenth century it began to replace such terms as infirmity, affliction, deformity, and monstrosity. More recently the obvious negative implications of the prefix "dis" calls for alternatives. I've been generally uncomfortable embracing the euphemistic term "challenged" but I think perhaps for the wrong reasons. My personal use of the term almost invariably indicates a positive experience as in being challenged to solve a puzzle or to achieve a goal or to surpass a rival in a contest. Yet the word, historically, beginning in the fourteenth century, has been used more as something one can be accused of, a fault or blemish. Into the seventeenth century, the term suggested false accusation or an accusation of wrongdoing. Then it came to be used in the sense of objection or a call to fight. "I challenge you to a duel!" It was not until 1954 (who figures these things out?) that it came to refer to a difficult task. Still, none of these implications seems quite suited as a preferred alternative to "disabled," but nor does this history support my preferred use. Words matter.

Years ago, I was teaching a course that somehow related to moving bodies. I was told that the room originally scheduled had to be changed to accommodate access for a student in the class. When I showed up for class, I met a young woman who had recently been horribly injured in an apartment fire. She had lost both legs and her hands were injured so severely they were incapable of holding a pen. She needed to insert a pen in a special glove to take notes

in class. I asked her to meet me after class. I confessed to her I had no experience with assisting her and that I didn't even know the most sensitive terms and the most useful and appropriate physical encounters. She said that she took the course because it focused on body so she might explore these very concerns since they were also new to her. We agreed to work on them together in the context of the course. I learned a great deal from her over the following couple of years. Among the most enduring was her suggestion that rather than disabled she felt more comfortable with the term *differently abled*.[23] The advantage of this term, as we discussed it, is that it does not simply divide the population into two separate and distinct groups, the abled and the not abled (the dissed), but rather allows us to realize that ability, no matter how measured, spans a wide and continuous spectrum and it includes, with nuance, everyone. This term shifts from a *movement* basis, which is to establish place categories, to a *moving* ongoingness that must be continually negotiated and evaluated. Everyone has differing abilities in various areas of their lives, and their abilities are frequently changing. I appreciate that this term allows for all people to experience changes in ability over time whether the result of events or conditions beyond one's control or due to efforts made to change. I also appreciate that the word "able" dates from early fourteenth century Old French *hable* "capable; fitting, suitable; agile, nimble" from the Latin *habilem*, *habilis* "easily handled" from *habere* "to hold." In other words, I love it that able, ability, like grasp, are body based in the distinctiveness of human hands that accommodate being nimble as well as holding.

This is a book about moving, yet it is also about coherence and difference seeking to demonstrate that it is in the embrace of difference, without the urge to resolve or fix or nullify difference, that we find power and vitality,

[23] In her 2021 book *Paralytics Walk*, Mary Dunn uses the term "embodied difference."

both aspects of moving. The distinctions among the differently abled are often manifest in terms of motility and body (access), but as a spectrum it includes all bodies. While there is a premise in my work that we are all biologically the same, this premise is intended only in the general sense of the functioning of the biological systems—skeletomuscular, nervous, endocrine, etc.—that comprise all human bodies. The glory of being human—I argue even much more so than in other animals—is that we are distinguished one from another manifest in a vast array of differences.

These differences are fundamental to what I find so fascinating about human distinctiveness. We not only find ourselves, via genetics, born with a vast array of differences, but throughout life our experiences, even the most banal, impact one way or another our abilities and we humans invariably spend enormous effort and resources enhancing and accommodating our abilities and attributes. Differences are what are interesting. Differences are what shape all the distinctive features of our identity. Valuations such as "normal" and "healthy" are social and political constructs that require their own analysis. Categories designated by such terms as dysfunction, disability, and illness are socially constructed categories that reflect responses and strategies to engaging difference, largely associated with the moving body.

We need be warry of the intentional separation of groups given such labels as "special" (special Olympics, special education) and "challenged," euphemisms for "abnormal" or "diseased" or "disabled" or "despised." They all reflect a measure of the fear of difference of any kind, that is, racism and xenophobia. Those creating these distinctions tend to seek the isolation, if not elimination, of these "others," considering their own identity as the only legitimate one, often even described as pure. The actions taken consistent with this strategy seek "power over" and singularity and homogeneity. Without doubt this failure to appreciate the vitalizing power of difference, of the differ-

ently abled, is common throughout history in all communities. Human history is, in a sense, written in just these terms. Presently, in the West (well, the world), hostility to difference pervades along with a disturbing set of actions. These are strategies of establishing and enforcing place, rather than dynamic interaction; movement rather than moving. Those who currently seek and hold "power over" in the West—white Christian males of means—give much attention to suppressing those who are different from them—disabled, LGBTQ, female, old, black, poor, even the ill (denial of health care and affordable medication)—and they shape policy and institutions to establish their attitudes toward difference and incongruity.

The continuity implied by the term "differently abled" encourages connection and continuity among people fostering empathy rather than separation and exclusion. We might relate to those differently abled from us if we recognize that we too in so many respects are differently abled. Empathy, "in feeling," is linked to the kinesthetic aspects of proprioception and the experiential basis for the evaluation of coherence/incoherence.

26

Goaling

As one who has for decades frequented gyms and fitness centers, I've experienced the annual explosion of bodies that turn up in gyms shortly after the first of the year. In January it is difficult to find an empty locker, you must wait in line to check in, the parking lot is full, and in every area of the gym there are new members trying to figure out machines. In the group classes people are bumping into one another because they have never done a fitness class before. The crowds typically last into February but by March the gym is back to its normal level. What's going on? The annual seasonal migration of fitness seekers.

We live in an instant gratification society of fast food, Instagram, Tik-Toc, and same day Amazon delivery. I recall that only a few years ago the television banner "Breaking News" was rare and grabbed attention. Now it seems every day has breaking news and yet, when I take a week or longer off from my glued-to-the-news habit, most things seem pretty much the same when I return. Everything is breaking every day it seems. We like soap operas and romance fiction because there is a crisis every day. We shape our lives around getting our constant fix of whatever is our current interest, and we expect instant satisfaction in everything we do.

I taught Latin American dancing, especially salsa, for many years to thousands of people. Salsa is a social dance with many occasions to dance socially, often to live bands. To go salsa dancing is a promising social activity and dancing is an easy way to meet people. Like many social dances the basic step pattern that distinguishes a dance is

relatively simple. For salsa it amounts to changing weight from foot to foot six times in eight counts of the music. One steps on each of the first three counts (there are other styles that emphasize other counts in the music), none on the fourth, and one on each of the next three counts five six seven, none on the eighth. That's it! One, two, three, …., five, six, seven, …. Left, right, left, …, right, left, right. And of course, this pattern is done facing a partner each stepping on opposite feet. Seems easy enough.

Many guys and some ladies decide that learning to salsa dance is a promising way to meet women (or men) and potential partners. They take classes to prepare. After all, how can one go to a salsa dance event and not know how to dance? Special pressure is on the men since they sense they must "lead" or at least give the illusion of doing so. My beginner salsa classes were filled with these eager dancers. Once attaining adulthood learning new and patterned forms of coordinated moving becomes increasingly difficult for many. I have been regularly amazed that despite repeatedly telling students that the basic salsa pattern is "like walking, but less," many new learners are utterly confounded and can't seem to do even this basic step pattern. They look at their feet thinking that their habitual visual preference for engaging the world will somehow cause their feet to move. Lots have difficulty changing their weight on each step, seeming to think that extending a foot or tapping a toe is sufficient. It is not. Many have trouble with the subtleties of touch contact with a partner. The constant demands to adjust subtle touch pressure with another person many find remarkably difficult. Our touch contact with our environment is most often with objects and machines and we tend to experience touch as largely a force to affect an action: tap a key, push a button, turn a knob, pick up an object, throw a ball. We rarely experience the constant ongoing negotiation and constant modulation of touch contact with another person reacting to us in kind. To do this demanding touching while keeping one's feet moving in a rhythmic

pattern and stepping on specified beats in the music turns out for many to be overwhelming. Knowing they are supposed to "lead" many men reject any touch negotiation and vice-grip their partner's hands, often causing them pain, seeking to force them to follow. Women rarely appreciate this approach. Men tend to want immediately to learn fancy complex moves that look so impressive and to hell with the step pattern, technique, graceful movement, or subtle touch encounter with a partner, or the beat of the music. A few men quit after a few weeks, frustrated with the nuance, and settle on forcefully faking it on the dance floor or meekly allow their female partners to lead them; many are willing. The fact is that many forms of skilled moving require extensive training, the acceptance of critically guided constant revision in technique, and extensive repetition or practice. Still, I often find even movement specialists indicate that learning a skill, changing habits, building a lifestyle can be quickly accomplished. I do not agree.

A large segment of the population approaches weight loss on similar terms. Trying a new diet or plan or activity that promises rapid weight loss, only all too soon to be discouraged by the disappointment of not seeing results quickly enough. The conjunction of the word "fad" with the word "diet" sort of tells it all.

The predictability of crowded fitness centers the first months of the year is obviously due to the widely practiced cultural vogue for setting New Year's goals. It is part of the annual explosion of interest in getting healthy, losing weight, looking better.

My attention is on what I see as the excitement and enthusiasm that I experience and that I observe in others in contemplating, planning, and engaging in a new activity attached to concretely specified goals. I, as many I think, find it fun and interesting to think of goals and to plan how to achieve them. We are thrilled to think that, with this new diet plan, we'll quickly lose unwanted pounds. We are excited to take a salsa dance class, imagining ourselves

quickly impressing friends on the dance floor. We look forward to going to the gym with all the fitness promises of a new membership. What I find interesting is that no matter how many times we go through this social/personal ritual, despite our regular failing and frequent disenchantment, we find ourselves eager to try yet the next new thing to take up in the new year, somehow always believing that finally this latest one will work for us.

I suggest that an alternative to this cycle of hope and despair is available if we are inspired by the difference between movement as change in position or place and self-moving as ongoing constantly monitored vital action. Annual or periodic goal setting often starts with feeling and acknowledging a problem usually something unhealthy and usually identified by a number like weight or measurement, then identifying a means to a hoped-for solution. Then action must be taken, often including an outlay of cash, and setting a date and a concrete numerical marker as a goal. This strategy is articulated as going from place to place. I weight 190 and I want to get to 175 by February. I'm lonely and have no friends so I'll take a six-week salsa dance class and then I'll have new friends. Typically, one starts out with enthusiasm keeping to the scheduled plan and trying to hold on to the promised outcome. Yet as time passes, often rather soon, the failure to make progress toward the new place is discouraging, the effort required is greater than expected, the excitement subsides, as does the persistent action called for by the plan. Enthusiasm often turns to guilt and personal self-disappointment. The early signs of progress often slip away, and the accompanying discouragement turns on its head along with all the thrill, excitement, and promise that we felt in coming up with and initiating the goal. Now we feel guilty that we must pay for the gym membership we no longer use, or the diet plan we no longer follow. The guilt and self-punishment make us unhappy sometimes to the point that we are worse off than when we started the process. This to me is consistent with

our common expectation of movement as change in position and place. It has everything to do the beginning and ending places, the outset need and end desired result. We see ourselves as fat, out of shape, unhealthy, lonely—here—and we seek to be thin, fit, healthy, social—there. What we fail to account for is the process of self-moving that must be ongoing.

Adding the -ing to goal is a grammatical change that may be accompanied by a change in strategy and a refreshing perspective for healthy living. Moving is being in no place, yet also inseparable from life and process. Moving implies a here and a there, yet the emphasis is on the ongoingness and on the experience of the moving. Toned bodies and smooth moving are undeniably pleasurable, even if accompanied by muscle soreness and tiredness. I recall when, in middle age I found myself dancing, the sore awkwardness came with greater awareness of the amazing feeling of moving. I marveled at just the feeling I experienced walking. I still feel this way. What a pleasurable miracle it is to smoothly move along as a body. Perhaps goaling might encourage the same sort of experience. Rather than asking what can we do to fix a specific health problem; rather than ask what specific change do I want to achieve to finally be fit and happy; rather than seeking tools or changes chosen to accomplish a specific goal, a firm there, might we better ask what actions and practices might we do that feel engaging, healthy, challenging, exciting, pleasurable, satisfying every time we do (practice) them? Might we direct our attention to the ongoing actions more than the problems that need fixing, or the measures of the fix seen as final. I generally agree with that adage "no pain, no gain," but there are the pleasurable pains of the ongoing engaging a challenge, the satisfying pain of the tiredness and sore muscles that come from doing an activity that is fun and demanding. To punish oneself and suffer pain that have no connection to enjoyment or engagement or pleasure is

simply depressing and debilitating. It never works, especially in the long term.

Goaling, like self-moving, is the constant engagement of the whole organism in refining, toning, modifying the ongoing process driven by the force of an engaged life. It is possible to occasionally evaluate, as we do by considering movement, where we were and how far we have come, and even where we in time hope to be. Yet, the attention of goaling is the experience and feeling of the ongoing process. Rather than saying "my goal is to learn to dance salsa in the next month so I can meet a partner" one might engage the dancing to discover "I love dancing salsa. I was surprised to meet this fun person who also loves to dance. We are salsa dancers." Rather than saying "I'm starting this diet/exercise plan so I can lose 10 pounds in two months," it might be better to say "I love cooking and eating food that makes me feel good and healthy and I love my daily walks with my neighbor who also likes to cook. I feel healthy and alive. Oh my! Did I just lose a couple pounds?" Goaling urges the preference for the model of moving rather than movement, the preference to practice a lifestyle because we enjoy it, often because it is healthy, to the extent that it becomes something of who we are. This is surely preferable to the exhausting cycle of identifying problems and issues mustering resolution for solution. I'm no fan of emphasizing initial illness or some lack paired with a regime to fix the problem, to be healed.

While it is perhaps easiest to illustrate this approach with physical examples, it is, I think, relevant to any aspect of life. Educators have repeatedly shown that learning is best done when there is intrinsic motivation, that is, when the learner is interested and excited to learn. Punishment and reward are of limited value.

Goaling focuses on the quality of the feeling experience of doing, on the process, with schedules and measures being but a secondary part of the regular monitoring of the shifts and changes that characterize the

process. Goaling is akin to proprioception—the constant monitoring and adjustment of moving as it is moving. Goaling relies on kinesthesia, the feeling attribute of proprioception, by which we are aware of how our movings are experienced. Goaling is akin to understanding living as a skill constantly practiced because engaging life's challenges is pleasurable, satisfying. You know you are goaling if you realize you would do what you are doing because it feels healthy and vitalizing, little concerned about it producing some measure of results.

27

Not All Moving Has the Same Benefits

> The teaching body dances its knowledge softly so that the audience will, like it, go into a trance and so that, through virtual mimicry of its gestures, a few ideas will enter their heads via the muscles and bones, which though seated and immobile are solicited, pulled toward the beginnings of movement perhaps even by the work's little jig.
> Michel Serres

This era is marked by the proliferation of fitness centers, gyms, and health clubs from nationwide vast corporate facilities open twenty-four seven to boutique establishments for niche clients—women, high performance athletes, sufferers of injuries, new age mind/body folks, diet and nutrition concerns, weight loss. A growing number of health/fitness facilities focus on specialized forms—yoga, Pilates, martial arts, gymnastics, ninja. Some are remarkably inexpensive others are pricy prestige organizations with extensive attention to personal care, luxury facilities, and special treatment. This segment of fitness alone is a $30 billion per year industry and growing at an annual rate near ten percent. Many apartment buildings and complexes, housing communities, cities, and neighborhoods have recreation centers including a wide variety of fitness programs and equipment. Online and home fitness is also a large industry. Endless varieties of classes and workouts are available to stream free, many more for a membership or class fee. The home fitness equipment industry is robust spanning from stretch bands to Pilates reformers to treadmills and Peloton bikes. Spurred by the pandemic this

industry has grown the fastest topping $6 billion. Smart watches and phone apps have proliferated with upwards of 50% of adults owning a wearable device. Training programs for fitness teachers and personal trainers are thriving, and many are expensive requiring months to earn certification. It is not only cardio and strength training that is attracting attention, so too brain health and acuity, stress and anger management, and lifestyle coaching. Various demographics —young professionals, kids, athletes, working folks, the older population, moms with kids—have specialty facilities as well as abundant classes, literature, and programs. Add to all these the activities that have significant fitness benefits but are not principally advertised as such: social dancing and sports and hiking and VR gaming. There are endless products—nutrition supplements, clothing, equipment, self-helps—marketed to all these populations. Many people have fitness as among their central activities, communities, and expenditures. It can be overwhelming, but it can contribute to higher quality of life, good health, and an active community and friend-rich life.

As an academic who is also a dancer, as one who researches dance and moving as well as practices them, I have devoted much attention to many these facilities, programs, forms, and materials. I want to make a few comments on my sense of the state of moving, especially in the context of this broad complex of facilities and programs and communities and opportunities.

Until the pandemic restrictions beginning March 2020, I had been a gym-rat off and on, mostly on, for thirty years. It was in a gym that I discovered dancing, hip hop initially, and the result was a vast change in my life and everything about it. I was an avid road and mountain biker for many years, also a hiker and trekker. With the pandemic I shifted to online classes, now mostly Zumba supplemented with core training, that I still do most days. I've been in gyms and fitness facilities of many kinds and in many places. My moving practices deeply inform my academic research and

writing. I've studied dance and movement in countries across the globe and written extensively on the philosophy and biology of dancing and moving. Growing up in a farm family in a small village everyone did physical work, participated in community physical activities, took a strong interest in sports often as participants. The lifestyle of my childhood is still common to many communities I've visited in Asia and Africa and Latin America and rural communities in the US. Outside of Christian cultures in the northern hemisphere, dancing is often an important, even essential, part of religious life. These kinds of communities rarely have fitness centers. Work and lifestyle provide sufficient physical activity. Reflecting on my childhood, I can't imagine my farming relatives thinking they needed to go to a gym to get their exercise. The vast and complex fitness industry I have described is a largely Western modern urban phenomenon tied directly to the shift in human professions and lifestyle with diminishing physical labor and increasing wealth accompanied by demanding complicated schedules, high need for mobility, and a penchant for speed and abundance in everything material. High calory everything delivered fast.

Modern urban life has trended towards service, business, and technological work much of it involving sitting long hours in cubicles and more hours sitting in automobiles or public transportation commuting to and from work. We prepare for career by long years of school, sitting in classrooms and hunched over laptops. Evenings at home are spent sitting watching television; weekends watching sports or movies. In this style of life, fitness and recreation and health centers arise to supplement the largely sedentary and moving-limited lifeways. Successful fitness centers, in an odd and perhaps surprising way, serve communities where work and other aspects of life are not, in themselves, healthy. As a gym-rat for decades, it is clear I am an enthusiast for fitness and health centers. They have been critically important in my life. I owned and operated a

dance and music school for years. Yet, upon reflection, I am concerned that the values central to modern Western life are both moving discouraging and implicitly unhealthy. My academic profession is among the most egregious.

The experience of quarantine and social isolation that accompanied the pandemic for nearly three years reduced for many some of the incentives for health and well-being and shifted a significant portion of health-related efforts to online home solitary activities. Many workers moved from offices with a social community to working at home alone and communicating as tiny heads on a ZOOM screen. Lots do not wish to return to their offices. When we are not seen by others beyond our heads, we have less social incentive to appear fit and healthy or even get dressed. Other contributing social factors include an increasing population of people who live alone. The decreasing age of retirement paired with the increase in longevity (temporarily reversed by the pandemic) produces a growing community of retired people, many isolated and marginalized.

I have deep concerns about the centuries-long deeply engrained understanding that has led to the broadly held understanding that humans are essences or souls or minds or egos that occupy bodies. We owe this to the heritage of Descartes and the deep ambivalence of northern hemisphere Christianity regarding bodies. These understandings are socially and historically based, rather than on human and animal biology. I advocate for understanding humans as animate organisms, whole moving beings, even as we can hold concepts of distinctions like mind/body that influence, sometimes in unhealthy ways, our understanding of ourselves and our world. I advocate strongly for being fundamentally whole and not broken, healthy and not ill. I hold we should marvel at the complexity of the human body with its many interactive parts all essential to the moving whole.

From my earliest days as a gym-rat, I noticed a gendered distinction of activities that I find troubling and

that I oppose. While across Western history men have been strongly associated with mind and intellect and in Western religions the godlier sex (that's a whole story), in the gym men tend to focus on activities to enhance their brute strength and large muscly bodies. During that same history, women—bearers of children and keepers of hearth and home—are associated with body and feeling. This female gender prejudice shapes history and culture deeply (another complicated story). In gyms, women focus more on moving dancing group activities that have the greatest impact on coordination and cardiovascular fitness. Notably, however, men suffer heart disease and heart related deaths in significantly greater numbers (2:1) than do women. And women often are short on strength and suffer conditions related to inadequate bone density. Women are more prone to eating disorders. Cultural expectations on body image—the way we think others see us—influence these fitness choices. Men seek the appearance of strength and raw power, women curviness, thinness, and grace. There are important exceptions and plenty of them. Men, more than women, often play basketball and other highly active moving sports in gyms. More gender-neutral moving activities include treadmills, stationary bikes, and spin classes. Over the decades I have walked past the sea of grunting sweating men pumping iron, shocked to see the occasional solitary woman, to enter the group fitness room where only women, save me, are dancing together to music. In the simplest terms of gender-appropriate fitness, there are a few things quite concerning to me about these deeply culturally engrained gym-based gender-polarized fitness activities. They reflect questionable societal norms not to mention questionable health practices.

My best guess is that the huge upswing in public concern about brain health in the last decade or two correlates with the rise of incidence of Alzheimer's and dementia now identified in the aging population as well as the increases, until the pandemic, of longevity and

economic wealth in retirement. I regularly encounter people in their fifties who complain of loss of mental acuity, "I'm just not as sharp as I used to be. I sometimes forget what I'm doing." Certainly, there are real concerns regarding mental acuity; we are, after all, *Homo sapiens*, Knowing Humans. The intellectual—thinking and language—aspects of our being are essential to our health and identity. I've been fascinated by the many marketed methods of building and retaining a "healthy brain." Work puzzles. Memorize words. Learn a new language. Engage in conversation. Read books. My initial response is that these specific recommendations only make sense in a society where most adults are too rarely intellectually challenged. These activities, focusing on language and thinking activities, affirm the historical and social conception of the brain as largely having to do with intellection, with thought and language. This strategy is yet another manifestation of that pesky conception that we are essentially thinkers. "I think (and speak), therefore I am." We conveniently are either ignorant of or ignore that the brain functions in conjunction with the entire body with primacy residing in our moving, our action. When scholars have evaluated these methods of maintaining mental acuity, referred to as healthy brains, their findings are fascinating. They discover that working puzzles does indeed make one sharper and more capable … at working puzzles. Yet, the effects are often not much broader. What the examination of thousands of such studies finds is that the most effective and reliable strategy for building and retaining mental acuity—measured largely in terms of memory, reasoning, and awareness—is physical exercise, that is, self-moving. That makes sense to me. Yet, in my reading of many of these studies, I rarely encounter an extended discussion of which forms and styles of moving have the best results in creating mental acuity. While I strongly affirm the benefits of any physical activity, I think it important to consider what kinds of activities correlate with which health benefits.

The most gender neutral and widely practiced forms of active moving are typically walking, running, and jogging. When done in gyms on treadmills or stationary bikes, once one has figured out how to work the machine and use it without falling, many read or watch television while exercising. Or work puzzles! There is no doubt that such moving activities have positive effects on mental acuity as well as whole body health. They raise heart rate, increase blood flow, burn calories, and increase muscle tone. All these activities impact in positive ways the brain and nervous system, as well as the heart and muscles. They increase balance and fluidity of mobility. The possible downside of these styles of moving is that many people (I'm one of them!) find them rather boring, therefore they are so often conjoined with other activities: walking with a friend, reading a book while walking a treadmill or spinning on a stationary bike. The attention is diverted from the activity itself. Long live Descartes!

Not all moving styles and forms have the same health benefits. The forms I have found most valuable, not to mention amazingly fun, are those that constantly vary and require focused attention. These are dance forms and especially those in which patterns of moving, the synergies, are not repeated many times before changing. These are the forms in which moving is coordinated with music and other movers. The whole body including coordinated arms and hands, shoulders and hips, and even head movements are included. I did step aerobics classes for decades. Sadly, this exercise form is no longer popular because, I suggest, it requires the development of considerable skill before it becomes fun. These classes have instructor-called moves that are done both on the left and right and often on various sides of the step. The moves require extended sequences with turns and changes in direction as well as stepping on and off the step (raised platform). There is no opportunity to pause to think about the move; it must be executed on a specific beat in the music. This activity with called moves

that must be initiated with a particular foot on a specific count in the musical phrase has an amazing impact on whole body acuity. Given that there are dozens of distinct moves, each requiring multiple steps in a pattern, one has not only to act promptly and precisely but to know which sequence to perform. The demands for ambidexterity and for changes of orientation in the space are also challenging to the whole body. Coordination to music and the movings of other dancers adds even more challenge and fun. Such moving requires full and constant and focused attention to perform it successfully.

Now think of walking or jogging on a treadmill, even if working a puzzle while doing so, compared with step aerobics. The difference is not one measured in calories burned or total exercise minutes. There are no smart watch-based statistics that reflect the difference. The distinction is in the level of biomechanical challenge to the entire moving body. It is impossible to think about anything or lose focus on the immediate moving activity in step aerobics.

For many years I danced and taught a form of salsa called *rueda de casino*. It is danced in a circle with partners and the named (usually in Spanish) moves, performed simultaneously by all dancers, are called by one of the dancers. There is an extensive set of moves (hundreds) many occupying perhaps a dozen eight counts in the music. Many require changing partners. North American dancers sometimes compare *rueda* to square dancing; it is on demand and improvisational. I developed forms of this dance that, while dancing, had moves that involved changing the roles of the paired dancers, so there are no gender-specific or lead-follow distinctions. I have taught and danced this style of moving for decades with all ages, abilities, and genders. I taught it in high school, at the university, in the community. What I found was that youth learn and dance *rueda* rather easily. Through high school both genders are relatively equal in their capacity to learn. They have little difficulty learning movement oriented

equally to left and right or lead and follow. Yet, for students at college level a gender distinction begins to be noticeable with women generally more capable than men. I also found that the young adult dancers are slower to learn and gain comfort, confidence, and acuity, especially in the ambidexterity and gender-neutral aspects of the dance. As the age of students/dancers increases through adulthood this gendered difference and difficulty learning rapidly increase. The ambidexterity is, for many adults, nearly impossible. I found that where high school dancers struggle little with doing the same move to the right and then the left and with different relationships with their partners, as age advances these capacities for ambidexterity in moving and in orientation become increasingly difficult. The same holds for remembering calls and choreography. Surely this has to do with the expansion and strong entrenched establishment of synergies (bodied patterns of moving) and the reduction of plasticity due to the ongoing decline of demanding change in movings. We cite adages like "you can't teach an old dog new tricks." Yet, in my considerable experience this is simply not fixed. It takes effort and patience and tenacity, yet age and the relative stability of synergies and gestures need not prevent rising to the challenge of these demanding movings.

In the last few years, I have found that Zumba dancing has some of the same characteristics. This dance form of exercise involves following the teacher/leader with routines involving extensive repertoire of movings typically choreographed to specific pieces of music. The moves are not called so the on-demand challenge is low especially since, with experience, the chorography becomes known and can be anticipated. This too is an almost exclusively female-gendered form.

Thinking of my decades' devotion to this style of moving exercise and its effects on whole self-moving body health, I describe it as *on demand, highly varying and improvisational, music and group coordinated, persistently challenging, self-*

moving. When we understand, even generally, the physiology of self-moving in a varying environment, it is immediately clear that while highly repetitive unvarying moving (treadmill) is beneficial, it does not provide a workout for the many neuromuscular components that can be exercised by more demanding and complex and constantly varying moving forms. In practical terms this means the more whole-bodied forms include dancing (especially with on demand movement that includes music and socially coordination), playing basketball and similar sports, trail running (because trails are highly varying and have unexpected challenges like sliding rocks), even virtual reality games that demand instant responses to unexpected events (monsters and bad guys).

I'm concerned about the gender and age correlation with the practice of, attraction to, and abilities displayed in this more challenging style of moving. I acknowledge and experience that there are factors influencing moving related to aging that begin when we are quite young. I acknowledge that there are some structural gendered body distinctions. I suspect however that the root of the disparity is largely a societal one historically enforced. A surprisingly large number of fitness instructors of this style of moving are men, notably young. I have also found that in the non-Western cultures I have experienced, active dance-style moving is practiced by all ages and genders. We need reflect on aspects of our society that condition us unknowingly to assumptions regarding gender and age-related limitations on self-moving that are simply not physiologically founded and may not be healthy.

A recent study published in the *British Journal of Sports Medicine*[24] found that middle-aged and older individuals are "twice as likely to die in the next decade if you're unable to

[24] "Successful 10-second one-legged stance performance predicts survival in middle-aged and older individuals" 2022.

balance on one foot for 10 seconds." I read through the study eager to find their discussion of the physiological reasons that produce this remarkable statistic on balance. I found only the caveat related to the limitation of the study that "investigation of the biological mechanisms that may explain the observed associations between poor OLS [one leg stand] balance and all-cause mortality is required." I don't think one need be a medical scientist to offer a pretty strong hypothesis. Balance is directly linked to proprioception and the health and acuity of proprioception is inseparable from the practice of challenging varying forms of moving. And since proprioception is neuro-skeletal-muscular it necessarily involves the whole body. A dramatic demonstration is easy. Stand on one leg, lean over, extend one arm forward and the opposite leg backward. As you hold your balance you will soon likely experience a quivering of your ankle, perhaps the whole lower leg. This oscillatory moving is due to proprioceptors needing to be super active in regulating ankle and foot muscle excitations and inhibitions in coordination with vestibular assessments of gravity to retain balance. Balance is dynamic not static. Proprioception is, as I have repeatedly discussed, essential to posture, balance, kinesthetic feeling, motility, and what we often term mental acuity. Balance is, I suggest, a reliable measure of whole-body health.

The deeper insight, sadly missing in this scientific study, can be found in the late Michel Serres' wonderful *Variations on the Body* (1999/2012). His writing inspires the terms of a new harmony—the dynamics of tonus, of physiology. Standing balance is, he writes,

> not stable, but unstable, better still, metastable, invariant through variations, this equilibrium is constructed like a refuge or a habitat, composed like a musical score, over fragile epicycles or miniscule rapid ellipses, planned cams, minor stumblings recovered from, differentials of angles or of deviations quickly returned to the peace of

> the smooth and even, a sloped roof but, in all, flat . . . arrhythmia and prosody, even and odd, anharmonic seventh chord resolved, mixed consonance and dissonance, disquieted calls followed by thundering responses . . . these are the wonderful cycles of reciprocal support between the labyrinth of the inner ear, charged with bearing, and the spiral volutes of the external ear, which hears and produces music, converging in a black and secret center, common to both these networks, where I suddenly discovered the solution to the dark mysteries of the union of the soul that hears language and the bearing body ... disquieted experience, certainly, since the second word of this phrase designates, as does existence, a deviation from equilibrium, yes, destabilization followed by ecstasy, and since the first word expresses yet another deviation from quietude, yes, infinitesimals of exaltation—oh, our primordial elations, our delicate delectations! After the musical offertory hymn, might the Word itself have arisen from the uprightness, disquiet and quiet, of the flesh! (27-28).

While the social norms and common beliefs support the reduction of challenging forms of moving correlating with the advancing age—the older one is the lesser one moves—the scientific evidence that refutes these beliefs seems abundantly clear. The more active and challenging one moves, especially for those middle-aged and older, the more likely one is to live a longer life with greater mental acuity. Serres' philosophical poetry is encomium to the marvel of human biology of standing balance.

28

Moving Pictures

> The real voyage of discovery consists not in seeking new landscapes but in having new eyes.
> Marcel Proust

Photography is light writing or drawing, from the Greek words *phos* meaning "light" and *graphê* meaning "drawing or writing." I'm fascinated by the complex relationship among form, time, and moving at the heart of photography. To harness something as ephemeral and delicate as light to create an enduring physical image seems the work of the alchemist if not the gods themselves. As Susan Sontag observed, while photos defeat time's relentless melt they are also *memento mori* reminding us that we must die. As moving is inseparable from life, the ceasing of moving is death or its minion. The photograph, snatched from life ongoing, is a physical halt inviting reflection and appreciation.

Long interested in photography as well as moving and dancing, I have occasionally thought about how, in some respects, these interests are in stark opposition. My taste in photography has been to treasure the clearest images revealing detail otherwise invisible or ignored. I'm amazed at the gorgeous hidden world and the stunning clarity of reality possible in photos. I'm thrilled by experiencing in a picture the fine grain of a world that so often feels smudged and confusing. Clarity in images assures lucidity in reality. Perhaps a happy illusion. One technique to achieve tack sharp images is brevity of exposure, an approach seemingly confirming the scientific conception of time as comprised of infinitely small moments, a calculus of integrals, with the present, the real, being but the knife-edge instant where past

and future meet. In photography, the detail and clarity of the image increases as the length of exposure approaches zero suggesting such an image finally captures the real, impossibly giving place to moving. The result appears as the fullness of reality in extraordinary detail. Impossibly as the flow of reality is halted, the resulting image vastly opens and expands our access and experience of reality. I am a bit in awe of the technology of photo equipment that can vary exposures from long periods to intervals as brief as thousandths of a second. How is that even possible?

Eliminating duration halts moving. What ruins my favorite kind of picture are tracings of moving that, because it is never in any place, appear as blur and fuzziness, ghosts of the living. Yet photography is inseparable from time and moving. A zero-exposure time makes no photo. Ironically ultimately moving trumps place even in photography. The challenge I've recently embraced is in denying my urge to eliminate the ghosts of moving to create images that, while still fixed include hints or reminders of the fullness of the human experience of time as well as honoring the insight that moving is in no place. I experiment with various techniques that attempt to retain in still images the evidence of moving. Light trails, motion blur, intentional camera movement, and other methods that leave traces of moving. Careful compositions lead the eye on a journey through the photo intimating something like story. Macrophotography captures detail simply not perceivable by the ordinary human senses. An enlarged or macro image of the tiny reproductive parts of a flower or the eyes of an insect reveal otherwise invisible aspects of banal moving living subjects that astound.

Perhaps our endless fascination with photos is because they engage an aesthetic of impossibles highly appropriate to the sensibilities of the modern technological world. Four billion images are uploaded to various internet platforms every day. The most prosaic selfie—"I am here!"—is graffiti of sorts that impossibly counters the inevitable

ongoingness of moving that is life. Photos give place to moving. Photos halt flow. Photos give duration and story to place. Photos are comprised of impossibles. Human beings are distinguished by their embrace of impossibles experiencing them as generative of the ongoing dynamics and vitality that is inseparable from moving itself. It is fascinating that while the technical distinction as the copresence of impossibles would seem to identify only marginal aspects of human life, the photograph in contemporary life is an excellent example of a gestural prosthetic agentive action frequently repeated. With cell phone cameras we photograph our way through life. Taking and sharing pictures is a gestural practice distinctive to contemporary life. It is my intent, like that made possible by photography itself, to appreciate the extraordinary power and potential of this aesthetic.

Light and its speed correlate with the scientific sense of time, yet the human experience of time, as I've discussed, is rich and full. The present in experience is not razor thin but fat, as I call it, including reverberation, memory, recognition, comparison, anticipation, and an essential if seemingly impossible backward referral in time. Remarkably, by grabbing an instant out of the flow of time, a photograph serves to open reality to the unhurried process of examining and appreciating detail that is not possible in the natural processes of perception. Photos are framed and composed to intentionally present an understanding of reality revealed only through the organized stilling of its movings. Photographs offer something like a reality timeout, engaging a remarkable opening, a mode of duration, to appreciate what the ongoingness of time does not permit. Halting moving—denying moving its distinction—reveals secrets of the remarkable dynamics of movings. Videos, that is movies (interesting name), do not allow this remarkable copresence of varying kinds of time. My interest here, and in my own art, is with still images, not movies. It is notable however that video/film/movies are illusions of

moving based on the biological limitations of human perception. We experience seeing multiple fixed images in a brief interval, the frames comprising videos, as moving. Another biological limitation is our inability to see much of the microdetail in our quotidian perception of always-moving reality. We are not capable of analyzing the processes of ongoingness of many moving objects. Just attempt to discern the sequence of the footfalls of a running horse. We can't do it. Étienne-Jules Marey (1830-1904) and Eadweard Muybridge (1830-1904) were the first to take timed series of stills of a running horse cutting its moving into still slices revealing the details of foot falls hidden to ordinary human perception. Halted time opens perception to the movings across time.

Now what of my dual interests in photography and dancing? They are indeed contrasting if somewhat complementary with respect to form, time, and moving. Photography engages a transduction—a conversion of one mode of reality into another—of the ongoingness of reality by means of yoking light to create a fixed image that opens reality to a kind of duration that enables savoring and contemplation. Its power may be appreciated in terms of the copresence of these two modes of reality—ongoingness and stillness—an aesthetic of impossibles that is distinctive to being human. Whereas photography produces material object, dancing is ephemeral both in its making and as the product of its making (performance). The moving action of the dancer is also the intended art produced by the action. Maker and thing made are not only copresent they are the same moving body. Yet dancing is distinguished from quotidian banal moving, dancing is arting, as it amazingly creates a double face, an othering of the maker, a copresence, clear to all who recognize dancing. In dancing the artist self-others becoming the dancing fleeting form, the dance as a reality being made or revealed, as well as the dancer making and being this copresent moving reality. The ongoingness of dancing, the -ing of dancing, distinguishes

this arting as honoring the very distinction of moving, its being in no place. I believe that dancing, not unlike music, is in some sense the purer, to use perhaps a controversial term, art form regarding its honoring moving by moving rather than by making it into a material object. Yet both photography and dancing are examples of the importance of aesthetic of impossibles to human distinctiveness. A beguiling challenge is the photography of dancing.

29

Coherence & the Creative Works of AI

Artificial Intelligence (AI) has become increasingly accepted if mostly tacitly. We do a Google search for running shoes and immediately ads for running shoes show up in the margins of our news stories and social media pages. We "like" a "friend's" post and her interests begin to shape our own through algorithmic nudges. Our tastes, our values, our information, our friends, our world are all shaped, often to the extent of being wholly constructed, by AIs operating quietly on all the media platforms we must navigate daily to survive in modern society.

Breaking news late in 2022 placed AI/robotics in daily headline news with the release of the stunning and seemingly sudden explosive expansion of achievements. ChatGPT, a freely available phone app, can seemingly answer any question creating a sustained narrative. Capable of writing whole essays that would pass for college students' work seem to threaten education itself. Other AI apps can create illustrations and "art" quickly from simple commands. Robots in human form make eye movement and facial gestures as they converse with humans. The response has been a fascinating combination of excitement imagining a future with intelligent AI/robot companions for all and downright fear that these AI/robots are approaching the developmental stage of taking over the world.

The seeming "intelligence," deemed artificial because it is machine-based, is the product of the collection or "mining" of enormous amounts of data tagged to each of us and to hierarchies of organization for the purpose of generating statistical probabilities regarding what we like,

what those who are like us like and thus we should like as well, and so on. Human techies construct and tweak the AI algorithms which are sets of rules for calculations and the parameters for collecting information. Programmers sometimes create metalevel AIs that control and tweak other AIs. This astounding complexity is possible because of the exponential expansion of calculating speed and data storage capacity as predicted half a century ago by Moore's Law.

Given my shift away from the importance of meaning towards that of a coherence/incoherence continuum, my reflections on Artificial Intelligence have sometimes pushed me to wonder if such machine systems are not also simply operating on the same coherence/incoherence principle. After all what AIs do is calculate hierarchies of probabilities. Aren't probabilities a measure of degrees of coherence? If I Google running shoes, then the AI, based on the big data of all those who Google running shoes, calculates that I have a higher-than-average interest in buying running shoes. It calculates a factor of coherence, of fit: the likelihood of me buying running shoes. I must ask myself, "Am I an AI posthumanist after all?"

Writing like a human has long been a litmus test for computers. In 1950, Alan Turing, an early inventory of computing machines and arguably the founder of AI, devised a test in which a person would communicate, out of sight and by print only, with a computer and a human being at the same time. The test is for the examiner to discern which is which. The test is passed when more than a third of the testers considered the computer to be the human. The test conducted annually was not passed until 2014, yet since then remarkable advancements of AI make the test now seem quaint. Of course, today it is simply a part of life to have conversations with Siri or Alexa or Google *who*—we personify them—can carry on limited conversations and provide seemingly endless useful information. IBM's Watson was a forerunner developed to the level of being able in 2011 to defeat human experts at the

televised game show "Jeopardy!" Computers can defeat chess champions and even, in 2015, the ancient unfathomably complex game "Go." Computers can create art and music and poetry.[25] We are now, it seems, in the golden era of AI advancement. Yet all these AI feats are based on probability calculations, continually refined by the ongoing crunching of more data, and added parameters. Some algorithms have billions of parameters. Coherence is a measure of calculated probability ranking within the parameters of a data set.

AI can write prose as well.[26] The apparent quality of AI writings should convince me that these calculators are intelligent, artistic, and creative. Take a phrase from an AI written piece presented in a recent essay in *Vanity Fair*. "*It was late when I first heard the loud clicking noise coming from outside. As I looked out of my bedroom window, the tall grass swayed in an unseen breeze."*[27] The AI written paragraphs that follow are comparable. I could raise questions about the consistency of lateness and the usual darkness and the ability to see. I could ask what swaying grass has to do with clicking. Still, based on my decades of reading undergraduate and graduate student papers few of those would be considered superior, at least in style, to these machine-written words. Years ago, I read AI written sports reporting, amazed that it had the breezy style and sports-writer phrases that characterize the genre. Should I not graciously throw in the towel, so to speak, and give up my writing of this very

---

25 Simon Rich, "The New Poetry-Making Machinery: Shall code-davinci-002 Compare Thee to a Summer Day?" (*The New Yorker*, June 21, 2022). In the short time since I wrote this, the capabilities of AI to write poetry and narrative responses on most any topic has expanded exponentially with too many references published daily to mention.

26 John Seabrook, "The Next Word: Where Will Predictive Text Take us?" (*The New Yorker*, October 14, 2019). In just several years make these reports seem quaint.

27 Nick Bilton, "The New Generation of A.I. Apps Could Make Writers and Artists Obsolete" *Vanity Fair* (July 2, 2022).

sentence which surely an AI could write better? Nah! I'm stubborn.

One question I ask, "who is the AI writing for?" It for sure isn't another AI! It is not that AIs cannot communicate with one another, but they do so in binary code, zeroes and ones, or rather the electronic charges that humans identify as on or off, as one or zero. Look again at the sentences offered above. I have bolded some words. "*It was* ***late*** *when* I ***first heard*** *the* ***loud*** *clicking* ***noise coming from outside***. *As* ***I looked out*** *of my* ***bedroom window***, *the* ***tall*** *grass* ***swayed in*** *an* ***unseen*** *breeze."* Who is the AI trying to please with this writing? I've argued elsewhere for the corporeality of concepts and consequently for the corporeality of common words and metaphors. Likely I could argue, effecttively supported I believe, that every word in these two sentences, and especially every bolded word, is comprehensible only to a self-moving humanly bodied being. AIs can write such sentences by analyzing enormous amounts of human written prose, words dependent on moving feeling bodied biological human beings. Yet it takes a human reader with a human body to have any comprehension of these AI writings. AIs do not **hear**. To an AI, **loud** is a volume measure like a number on a radio dial. **Loud** does not cause an AI discomfort or to feel energized or terrified. **Noise** has to do with the volume and quality of sound, its effect on someone, some animate sentient one. What is music to one may be **noise** to another. **I**, the personal pronoun, is the identification of self, proprioceptively and neurologically based in body. **I** is a pronoun that identifies owning and experiencing a feeling of subjectivity. AIs do not have an **I**. And so on through all the bolded words. When an AI uses any of these words, the sentences and paragraphs are no different than calculating the numeric value of Pi, an endless series of digits, an endless calculating task comprised, for the AI, of zeroes and ones, of electronic charges.

Imagine that AIs were to simply replace all human writers—that's what we fear—and for the next few years

only AIs did any writing, and all their program adjustments were based on the expanding universe of writings. The AIs would write what they were tasked to write. AIs could produce billions of documents a day, added vastly to the expanding universe of all known writings, their own data set on which their writings are shaped. What happens when the greatest percentage of all writing that comprises big data is writing done by AIs? This would, it seems to me, be a situation of AI "self-referentiality" (though they have no sense of self) that would rather quickly devolve towards mere machine code, at best drivel or utter redundancy.

Imagine another scenario. Put AIs in a room by themselves and instruct them to write whatever they want. Program them to consult with one another and give them access to all printed words. Shut the door and walk away. An AI "writers' room" if you will. This scenario would make absolutely no sense. AIs aren't inspired. AIs are not curious. AIs are not social. AIs have no urge or need to communicate with one another. AIs have no interest in externalizing their calculations, as writing externalizes the thoughts and ideas and feelings of human beings. AIs aren't concerned with, much less have feelings related to, birth and death, love and loss, issues and problems and ideas and wonder and awe and incomprehensibility and legacy. AIs don't get tired or irritable or angry or need a cup of coffee. Indeed, they are not concerned with anything. They merely perform the task of their programming, the human set parameters of their calculations. We tend to personify them as is the penchant of our human imagination. Interestingly, AIs tend to dehumanize humans—my construct of the *information cyborg*—yet it is not their intention to do so. I'm fascinated that all the discussions I've read about the very real dangers of AIs taking over many human roles in society—already achieved in many areas—are based on seeing human beings as comprised of data (information) or whose worth is valued only in terms of information. It is hardly contested that, if we consider being human as limited

to being an information cyborg, we will soon become, if we are not already, obsolete. It is essential to foreground the understanding and appreciation of the distinctiveness of being human when considering the real consequences of vast change due to remarkable advances in AI. For me, that means focusing on humans as self-moving organic bodies designed through evolution to embrace and to be realized in an aesthetics of impossibles.

Coherence/incoherence for AIs is a probability calculation of information parameters, whereas coherence/incoherence for humans is a feeling kind of knowing deeply seated in the subjectivity of the miraculous capacity of moving bodies to feel themselves moving. There seems to be some widely held assumption that there will be a singularity—a breakout point, when the increase in speed, the capacity of data storage and the sophistication of AIs perhaps even to modify and reproduce themselves—when AIs will become indepen-dent of and in control of human beings. This is marvelous fiction, but it doesn't really work. While I acknowledge that machines can supplement and complement human animate organics—this is referred to as a cybernetic organism or cyborg—I fail to see any possible bridge or pathway leading to a machinic species independent of and wholly separate from, much less superior to, animate, indeed human, biological organisms.

Humans can equate a series of binary digits with numbers and letters, knowing that they are the same but also not the same at all. Continuing, we humans can equate a series of numbers and letters with words and objects in the world, knowing that they are not the same. We don't attempt to resolve the condition of these impossibilities because we inherently know this structurality as essential to what is distinctively human, what makes us human. I'd suggest that while a machine identifies a stream of zeroes and ones—rather binary electric charges—as letters and words and sentences and paragraphs, it has no awareness that each is a transduction, an equation of the ontologically

distinct. For machines it is all electronics. Machines don't muse about the wonder that strings of zeroes and ones evoke the realities and feelings of love and death and fear and anxiety and excitement. The surprise of incoherence is not felt. AI calculates a probability measure whose significance is unknown and unfelt. Machines don't get excited to buy running shoes. Their toes don't blister if they buy the wrong size. Machines don't shed tears.

In writing *Religion and Technology*, I discovered a long history of art—literature and film mainly—that presents human-made machines that I refer to as AI-robots or androids. Interestingly these figures are often subject to what I have concocted as the Ultimate Turing Test. This test, as I imagine it, is a wonderful example of the magic of an aesthetic of impossibles. The human examiner interacts with the android—knowing full well, often reminded by visible plastic and wiring, that it is not human or organic—to determine if she or he comes to feel that these androids are human. Think of Data in "Star Trek" or Ava in the 2015 Alex Garland film "Ex Machina." The idea dates from antiquity with Pygmalion and Galatea that inspired the long history of My Fair Ladies. An early novel *Tomorrow's Eve* (1886) written by controversial French author Villiers de L'llise-Adam imagines Thomas Edison being called on to build an android replica of an opera singer. The novel is the first instance of an android. Her male partner thought her beautiful but boring, so he sought an improved model, a sexy smart synth. One of the earliest examples of robots was the female Maria sometimes indistinguishable from the human Maria, on whom she was designed, in the classic 1927 silent film "Metropolis" by German director Fritz Lang. The delight that makes these fictive android characters so popular and has been so fascinating about the Turing Test (regular and ultimate), is that they engage an aesthetic of impossibles. The machine is not human, the machine is human. We interact with the machine as a human knowing that it is a hunk of plastic, metal, and wires.

Not too surprising, a great many of these made beings are female with their makers arrogant rich white men who claim the status of gods because of their supposed godlike ability to create a being that appears and is recognized as sentient. Drawing from the English title of Villier's book, I adopted the name "Tomorrow's Eve" to identify my own fictive creation of a female figure, an inspired composite of several of these made ladies. I'll not attempt to claim godly status. Too much responsibility. I was fascinated and inspired by Ava in "Ex Machina" who, in the end, takes charge, brutally kills her maker and her Turing-style examiner who has fallen in love with her, and then she escapes into the general human population. We never know if she successfully passes as human, is superior to and controls them, or simply goes dormant when her battery dies. Nietzsche would inspire us to see Ava as demonstrating an act of ultimate freedom in her god-killing act of murdering her maker. What greater act of independence and free will can be imagined? What is endlessly engaging about all these figures in their many creative art forms is that they demonstrate the power of an aesthetic of impossibles. They conjoin as identical—human-imitating machines and organic human life—entities we full well know share no common ontology. To machines coherence is but a cold dead calculation of probabilities absent any feelings or subjective sense. The copresence of impossibles for a machine either causes breakdown, malfunction, eternal loop, bug, or it is resolved into a zero-probability calculation. For the humans that the machines seek to imitate, coherence is the feeling kind of knowing born of the imprecise squishy blood and guts, nerves and muscle and bones, impulsive commonly miscalculating, hormoneally driven, unreliable sort of being to whom the whole world exists largely for them and their needs. The copresence of impossibles is the very engine of power and marker of human distinctiveness, the marker of sentient live.

Paean to Being Human

"You know this whole thing (the cosmos? nature? existence?) just may not be about us (humans?)." For decades I've heard this adage. I've always felt I was supposed to agree. I'm sure that occasionally I've responded with a tentative tiny nod. Yet my heart has always screamed in silent protest. I'm kind of in awe of being human. I totally get it. The maxim is of the contemporary critique of the ongoing limitations and ills of Enlightenment humanism. We must see ourselves as part of the larger universe, kinfolk with animals, interdependent with plants, inseparable from the health of the earth. We should be humbler regarding our roles and responsibilities across the board. A currently energized field of philosophy posits a posthuman world although so far as I can tell they really don't mean a world without humans, and they are vague about what might constitute a posthuman. This posthuman philosophy is informed by their sense of the importance of creating an alternative to humanism and by the necessity of meeting the challenges of the rapid development of AI/robotics on a supposed path to surpass or replace humans. It is arrogant to feel that everything is about us humans. Yes, I get it. Yet, take us humans out of existence and I can't comprehend anything at all really. I am certain this is anthropocentrism and perhaps carries some of the pitfalls of humanism, yet how to even contemplate anything being "about anything" without the distinctively human capacity to ask the simple, "so?" Even calling out the dangers of anthropocentrism or imagining a posthuman

world requires human self-awareness and critical intelligence. Cows don't discuss bovino-centrism!

For decades the core of my life has been dancing always joined with music. My immersion in both dancing and constantly reflecting on the wonders involved in the human bodied capacity to dance and sing have allowed me to focus, not on the limitations of being human, but on the vast near incomprehensible capabilities and potentialities of what distinguishes being human. Consequently, to dismiss being human, either because of some historical philosophical program or because of some imagined superiority of some electromechanical synth, is just plain nonsense to me. How can a new song be about or affect anything without the human ears to hear it, to hear it knowing it as song? How can concepts such as existence, cosmos, or universe—some final container, an inside that has no outside—be anything but impossibles given that inside/outside are corporeal concepts and thus arise from our self-moving human bodies? How can we have any intimation of other, beyond, the spiritual or indeed god, without the most common faculties that distinguish being human?

We might understand that cows go "moo" and chickens go "cluck" and dogs go "bow wow" and that they hear and respond, that these are their songs. We record and marvel at whale songs. Yet it is pretty hard for me to think that these animals recognize and contemplate metaphysical and theological or aesthetic dimensions of their songs, much less emotional ones, or that some few of them are inspired to create themes and variations on "moo moo" or "cluck cluck." Ponies don't pen poems; cows don't contemplate cosmos (cowsmos?). Without the inspiration or the biological human bodies in which songs move and inspire and enthrall, then what? In the large frame through almost all the existence of the cosmos, time and space as the physicists account for it, there were not animals or any life at all, just rocks and gas moving through space, heat and cold beyond comprehension. Imagining the whole of the

cosmos in prehuman terms, or, I'm quickly led to ask, why not endless numbers of universes? Not only our solar system, not only our Milky Way Galaxy, not only our galactic super cluster Laniakea, but our whole cosmos comprised of two trillion galaxies might just as well be but a grain of sand on an endless beach of universes. Without human reckoning, without anyone to even gasp, "Oh Wow!" how can there be any sense of inside/outside, any measure, any limit or not? We account for cosmic time and space in terms of the duration of our own Earth year, rarely considering that, in the really big context, our solar system arrived on the scene in the last tiny moment. The speed of light was not confidently known until the 1860s which was roughly when the term "lightyear" appeared. Would it be any different to measure time in terms of the duration of the birth, expansion, and contraction of our universe, say as the unit we now refer to as a lightyear? If "it" is really not about us, then why not reckon time in "amoeba lifetimes" or the period of the sun's existence? If we are not relevant, then isn't it just all matter (and energy) that doesn't matter, because mattering requires humans? Humans sing and play music and dance to express and construct and celebrate who they are. While all humans share common biology, each human's body is marked, made distinct, by its own individual physicality and shaped by its encounters with its environment. The differences are essential to the harmonics of sound and moving.

Why not drop fleshy biological bodies and embrace the artificial intelligent synths (androids) as viable posthumans? Yes, I know, AIs can write music and poetry and a whole lot of other things, and they are amazing at sciency stuff. But let's be clear. The "A" stands for "artificial" thus indicating that what they output that looks like real human intelligence is actually the product of cold calculating machines that simulate human intelligence. The very notion intelligence is human. These machines don't create music because they love it, because they are inspired by lost love

and life, or for the pleasure of other AIs. In Mali, near Dogon I watched a line of garden workers, each with a hoe all chopping together, all singing as they worked. In Bamako I went to a smithy where many workers sweated by their forges a dozen hours a day pounding out mesmerizing rhythms and counter rhythms. In the remote village Zambogou I watched and listened at the door of a grain shed where the women harmonized as they pounded millet. In Bamako with my Mali friends, we danced and sang and played music and joked and laughed every day after eating lunch. If you put a bunch of AIs in a room to work, the best you could hope for is a power hum. AIs don't take music lessons as kids being required to practice before they go out to play. They don't play in grade school bands or later spend all their spare time in a friend's garage passionately playing loud music. AIs don't write love songs when the AI next to them broke their CPU or about a discontinued motherboard or a dying battery. AIs don't learn to play with lip and finger beautiful, gorgeous instruments each of which has its own personality often made by the skilled loving hands of others bearing generations of craft skill. AIs don't hear music with sensitive ears or feel sad if they lose their hearing. They don't feel the base rhythm in their chests. What AIs can do is take vast amounts of digitized music samples marked (by humans) as the best music ever created and based on algorithms calculate probabilities of what constitutes the parameters of their input. These probabilities can be used, if a human directs the AI to do so, to chart sequences of notes. Random generators are incorporated to provide the illusion of novelty and the unanticipated. AIs can make musical scores and machines can electronically synthesize the sounds. Indeed, some symphony orchestras with human musicians have played this music. Yet, never forget, AIs don't get inspired to create music. They don't suffer writer's block. Artificial Intelligent music is data output from cold calculation.

Perhaps it's time we had an anthem that celebrates and honors being human. A melody that reminds us that we can not only hear, but we can also dance. Of course, all human singings and dancings already do this. Perhaps we need a theory of harmony inseparable from the ongoing moving of human bodies. Since there is no singing or dancing without moving human bodies perhaps it is the dancing singing body that best intones a fitting paean to human distinctiveness. Maybe I'm an aesthetic humanist.

Pythagoras (570-500? BCE), credited with the first theory of harmony, hearing rhythmic hammering followed his ears into the forge as "if impelled by a kind of divine will." We might imagine that Pythagoras danced to the hammered rhythms he heard. He also heard melody. Yet he could only imagine harmony as comprised of divinely set perfect chords represented only by a sequence of integers, the mathematical harmonics of whole numbers. And in trying to replicate the divine scheme Pythagoras had to ignore his own ears, perhaps also his own toe-tapping feet, as well as the fifth hammer that was part of the melodic rhythm that compelled him into the smithy. Millennia later, Johannes Kepler (1571-1630) theorized harmony based on his understanding of the purity of geometry. He modeled his theory of harmony on nested perfect three-dimensional geometrical forms centered on the sun, the correspondence of sound with the solar system and orbiting planets. The result, a sun-centered harmony, that only God—imagined, where else if not the center of the heavens as the sun?—could hear. Again, ears continued to go wanting.

Beginning in the time of Kepler, the world has steadily shifted toward the present imagined posthuman theory of harmony. Andreas Vesalius' publication of *On the Fabric of the Human Body* in 1543 opened, quite literally, the body in all its complexity to anatomical study in service to knowledge accompanied by shifts in medical treatment toward a modern scientific basis. In this lineage, the body is normalized and reduced to precise and exacting measures.

Advancing technologies, for example electronic scanning technologies, as Katherine Hayles wrote in her 1999 book *How We Became Posthuman*, "create a normalized construct averaged for many data points to give an idealized version of the object" (196). The body becomes an idealized and normalized form; the body becomes wholly representable by information. A common observation of medicine is that the body is seen and treated as normalized object, as information presented as lab test results and scans, with the often-accompanying impersonal and insensitive treatment. Variations from "normal" are the focus for the diagnosis of pathology. Where is this development heading? We might imagine this harmony as some wholly debodied cloud of information, the ethereal specularity of the Aurora Borealis or the simple purity of zeroes and ones. Perhaps finally we have achieved the great celestial melody wholly abstract, wholly transcendent, no longer bearing any taint of the fragile and weak human body; music finally freed of the variations of handcrafted musical instruments. The great information patterns singing as a heavenly host free at last of Pythagoras's annoying fifth hammers and Kepler's disturbing "unsettling parts." The great algorithms of The All reject nothing. The map has become the territory. Reality and divinity are but informational imitations of one another. We have but Bit (binary digital) Reality, Bit Music, free at last of sweaty dancing bodies.

Where is the ear to hear? Who does the resounding inspire? Do algorithms weep? Or laugh? Dare we suggest that god might be found (imagined) in hearing the singing ongoing, in the discord of the fifth hammer, in the marvel of the unreliable ear, in the variations among the violins, in the bloody mucusy unsettling parts? What irony the ear in the era of Bit Reality; and the feet where the cloud is the ground. What becomes of the alpinist? The dancer?

France's King Louis XIV (1638-1715) understood. He fashioned himself as the Sun King thus placing himself at the center of the solar system (universe!) where he could

not only hear the geometric harmonies, but also dance them. In the early days of ballet, a dance taught in his court, Louis danced the role of Apollo the sun god assigned the daily task of harnessing his chariot to carry the sun across the sky. Apollo is also the god of music and dance. In his dancing Apollo, King Louis constructed himself, in the copresence of court and cosmos, as the divine king; the patterns of dancing and music were the harmonics of his court and his kingdom and his world. The long history of ballet continues this tradition. Perhaps its grand vision is why so many refer to ballet as "*the* dance." Ballet is at once the apex of sheer physical mastery of moving human bodies as well as being transcendent, barely connected to earth (*en pointe*). Until recently the Ashanti in Ghana selected their royalty based on their ability to dance. How such selection criteria might transform Western politics! It would surely save the world and the planet. In Hinduism Nataraja, the Lord of Dance, danced the world into existence. Today dancing marks life; ballet, perfection. So too the alpinist, the gymnast, the musician, the violin maker; all skilled coordinated collections of ears and feet and fingers.

Though it was but a thought experiment Étienne Bonnot de Condillac (1714-1780) heard the melody of the moving body. His puzzle was to imagine a man [sic], a stone man, a stone man equipped as is any man with the capacities to feel and perceive and think, but for his being rigid, that is, comprised of stone. The thought experiment was then to consider what would need to occur for this flying stone man to come to sentience, to an awareness of himself and the world? Condillac's insight was that this man would need but a moveable arm that he might touch himself. In the moving touching connection, hand moving to touch body, there arises awareness, sentience, and self. The hand feels the body as object; the hand is felt to be an integral part of body; the copresence of self and other, object and subject. The near synonymy of touching and moving awakens the senses and the awareness of self and world. Touching and moving

open the ears and warm the body. A few decades later François-Pierre-Gonthier Maine de Biran (1766-1824) simplified Condillac's insight and foreshadowed the discovery of proprioception by realizing that this creature would not even need touch himself, he would need only move his hand. There is feeling associated with self-moving; an "inner touch" as Daniel Heller-Roazen termed it or kinesthesia. One wonders what sort of body moving this thought experiment might have produced had, like Pygmalion, the philosophers imagined themselves in the presence of a lovely stone woman. Galatea was quickened by the warm touch of Pygmalion's lips.

In the posthuman rise of information to replace body and world, I think it is urgent that we hear and act to develop a contemporary harmony, one fitting our current needs. It must be a harmony of body; songs singing, dances dancing. Hayles, writing on posthumanism still opts for bodied human beings. She contrasts body, by which she means this normalized reduction to the body universal, with embodiment, by which she directs our attention to the individual lived body.[28] Embodiment, or as I prefer "being bodied," considers the aspects of body that are inherently performative, active, and improvisational (Hayles, 197). Hayles makes a distinction quite like that between movement as backfilled (Bergson) and living movement (Barbaras), what I call "self-moving." She quotes Maurice Merleau-Ponty's "Eye and Mind" essay to help make the distinction. The body is, Merleau-Ponty wrote, not "a chunk of space or a bundle of functions" but "an intertwining of vision and movement" (quoted in Hayles, 203).

[28] N. Katherine Hayles, who charts the advent of posthumanism, distinguishes the terms "body" and "embody." I am sympathetic to Maxine Sheets-Johnstone's observation that the verb form "embody" suggests that the base condition is to be without body, as mind or soul perhaps. I often prefer simply to use "body" as a verb formed by context (even if it may not always work perfectly), yet with that caveat I can consider the important distinction Hayles makes.

Or as Elizabeth Grosz wrote in *Volatile Bodies*, "there is no body as such; there are *only bodies*—male or female, black, brown, white, large or small—and the gradations in between" (quoted in Hayles, 196). While I believe much can be gained by considering basic common human biology, it is essential in considering human distinctiveness to appreciate that every body is someone's body and every body is necessarily one defined in some sense by a particular place and time. Body is always in context, gesturing, individuating, responsive, and with agency. It seems odd that despite us all constantly experiencing the distinctive qualities of bodies, the normalized body has so deeply influenced us. How common it is now to think we need consult our biometrics rather than our feelings to determine our own health and fitness (I'm often obsessed with this process that, for me, involves multiple devices); our feeling moving body is frequently secondary to our informational body, a body comprised not of flesh but of numbers. Since Pythagoras it seems we prefer numbers to feet and fingers and ears and lips.

Hayles parallels the distinction between body and embodyment with the contrast between what she terms "inscription" and "incorporation." The implications are obvious in the terms themselves; one based on writing, and one based on corporeality. Inscription is associated with the informationalization that constitutes the normalized body. It is the algorithmic crunching of data to calculate the parameters of the normal body—the medical body, the social body, the political body, the commercial body. The individual body becomes but a tagged data set used for marketing and social networking and diagnosis. Incorporation is the body in its moving and gesturing specificity that is coincident with the corporeal concepts that correlate with the distinctiveness of body morphology and biology; distinctive both as having arms and legs and fronts and backs and as brown or white, as young or aged, as short or tall, as variously abled, as cultured and located in history and

geography. Inscription is the formation from the outside based on collective expectations whereas incorporation is the formation of routinized gestured felt experience. Elizabeth Grosz understood these categories as polar, rather than as exclusive, positions in a field of interaction; as mobiatic rather than separate and distinct alternatives. I see them as energized by the dynamics of an aesthetic of impossibles.

These distinctions may inspire a new understanding of harmony. Since the sixteenth century the trajectory has been toward the normalized body, the information body, the Bit Reality body; a trajectory that is madly accelerating today. The harmony associated with the normalized body is one of calculation and probability and data ranges, perhaps novel in the short term, yet increasingly bland and predictable as its own output progressively becomes its only input. Like the normalized body of medicine, variation beyond defined ranges tends to signal pathology.[29] All becomes inscription, and the body no longer sings, it just registers. The new harmony must protect the precious moving living singing dancing body, the experience of volatile improvisational bodies moving unpredictably through space and time. Confined to body yet transcendent. Fleshy bodies bellow and moan, cry out in pain, screech in frustration, laugh with joy, and sing and dance—all incorporations (in-body-ations) in the new harmony, the harmony including all the variations of moving sensing experiencing living bodies.

The late French philosopher Michel Serres (1930-2019) is an exception among philosophers in including the living active body throughout his writing, often invoking his personal experience as a seaman and hiker (alpinist). He hears harmony as a moving body. His writing style sings the

[29] I have found that medical specialists, while relying on these numbers and making life and death decisions on their merits, fully admit that the variations, complexities, random elements, and unknowns are expected to trump the numbers time and time again.

body poetic perhaps more so even than its content. I have acknowledged that had I to choose but one book I might have if deserted on an island it would be Serres' *Variations on the Body*. My copy has been read so many times all the pages have fallen out. Throughout much of the first section "Metamorphosis" of his *Variations* he regularly refers to the upright walker in recognition of the long history of the evolution of humankind leading to our distinctive upright posture.

> You recognize the alpinist, that man who knows how to walk, by his risen body. Standing erect is therefore acquired and has more to do with the ear—no doubt, but also the entire body and pleasure—than the eye. At the same time as learning to walk over steep, difficult, capricious grounds, you must learn to find your seat there; then and then only, when all the skin of the foot sends the entire body a hundred delectable messages of velvet, wool and silken comfort, do you learn how one becomes hominin, banishing from yourself the univalve, the quadruped and the ape—an erect animal, a risen child, an adult person expelling everything that remains infantile. Leaving childhood and the animal, what joy at last: the body gets its kicks" (26).

The risen body, both the evolution from snail and quadruped as well as the rise from the creeping infant to the upright walking adult, invokes an awakening of the ear (the location of our organ of balance) and the feet, the marvel of human feelings of joy and the pleasure of touch. Serres reminds of the journey from the foot stomach that is mollusk through various rising modes of motility to the erect posture of hominin where the body both literally and figuratively gets its kick. Moving is touching is feeling is experiencing is human. To Serres this rising is experienced

as body resounding with world; an adumbration of the new harmony we seek.

> Sustained, this unheard of song rises from the body, in the grip of rhythmic movement—heart, breath and regularity—and seems to emerge from the receptors of the muscles and joints, in sum, from the sense of the gestures and movement, invading the body first, then the environment, with a harmony which celebrates its grandeur, adapting to it the very body which emits it, then abounds in it, filled. Taciturn since the beginning of the world, the earth and sky, the cold shadow and the mauve predawn light strewing with pink the ice corridors and needles of rock, together sing the glory. Daylight spreads through the enormous volume. I hear the divine invading the Universe (10).

The journey from integers to the heliocentric harmony of geometrics arrives at long last back to the very ears Pythagoras ignored and to the body comprised of beating heart and breathing lungs and moving muscles. Song arises from the rhythms of gesturings and movings, from the alpinist and the gymnast and the dancer. Song fills the environment expanding outward in celebration of the earth and sky. In the song of the body, one hears the divine presence of the universe. Serres suggests we must listen to the living body sing that we may hear the voice of god.

Standing balance, as I noted in another essay, is considered by Serres in a passage that inspires the terms of a new harmony—the dynamics of physiological tonus. Standing balance, Serres writes, is

> not stable, but unstable, better still, metastable, invariant through variations, this equilibrium is constructed like a refuge or a habitat, composed like a musical score, over fragile epicycles or miniscule rapid ellipses, planned cams, minor

> stumblings recovered from, differentials of angles or of deviations quickly returned to the peace of the smooth and even, a sloped roof but, in all, flat ... arrhythmia and prosody, even and odd, anharmonic seventh cord resolved, mixed consonance and dissonance, disquieted calls followed by thundering responses ... these are the wonderful cycles of reciprocal support between the labyrinth of the inner ear, charged with bearing, and the spiral volutes of the external ear, which hears and produces music, converging in a black and secret center, common to both these networks, where I suddenly discovered the solution to the dark mysteries of the union of the soul that hears language and the bearing body ... disquieted experience, certainly, since the second word of this phrase designates, as does existence, a deviation from equilibrium, yes, destabilization followed by ecstasy, and since the first word expresses yet another deviation from quietude, yes, infinitesimals of exaltation—oh, our primordial elations, our delicate delectations! After the musical offertory hymn, might the Word itself have arisen from the uprightness, disquiet and quiet, of the flesh! (27-28).

Serres reminds us that the ear is present in standing balance as well as harmonics. The metastabilities of the interaction of nerve and muscle is a fragile tension among competing interests never resolved yet always dynamic in its sought-after coherence. Standing balance is not static, but a chaos of competing biomechanical forces and interests impossible to resolve to stillness, to immobility, yet it engages, Serres notes, the "dark mysteries of the union of the soul that hears language and the bearing body." In physiology this is often referred to using the musical term "tonus," the dynamics of balance not as fixed position, but as the oscillatory oppositional dynamics of living flesh, as

of sounding music. Tonus is a factor both of physiological architecture—for example, muscles occur in oppositional pairs, the literal entwining of nerve and muscle in proprioceptors, the copresence of inhibitory and excitatory proprioceptors—as well as in energetics—that is, tonus correlates with the dynamic readiness and engagement of muscles.

Serres does not confine this musical score to the body; he suggests that the Word (capitalized perhaps in allusion to John 1:1 that he inverts) of god itself may have arisen from the flesh understood deeply in terms of the ear's involvement in standing balance and in song. The implication of this new harmonics is that the Word is not the stable unchanging presence of the perfect god, but it is the Word made flesh—or better, human flesh made Word—that is the unresolvable dynamics of an aesthetic of impossibles, including discord and dissonance and the constant presence of the imbalance (falling, the Fall) and incoherence (chaos, Sin) as essential to the energetics of living flesh. This harmony reverses the Pythagorean "idea" that god's purity comes first, and the imperfect human ear and feet are not to be trusted despite their affect and thus in a sense they are inexplicable degradations of perfection. It also offers a reinterpretation of the phrase "in the beginning was the Word." Inspired by Merleau-Ponty we might suggest, "in the beginning was flesh and from the moving flesh came the word and god." Achieving upright posture and standing balance attests the harmony of the Word, an arising from moving flesh that marked the beginning.

A deep appreciation for the song of moving body and its resounding throughout the universe is found in the late French philosopher Jean-Luc Nancy's 2007 book, *Listening*. Nancy (1940-2021) proposes a "fundamental resonance, even around resonance as a foundation, as a first or last profundity of 'sense' itself (or of truth)" (6). For Nancy, listening is the tense and attentive mode of hearing

requiring a sense of anticipation, an emerging, an almost thereness. In a sense listening indicates foreknowledge or its conditions. Rather than passively hearing, listening is directed and focused and shaped by anticipation and expectation of coherence or, in the vernacular of sound, of sonority or resonance. Rather than itself being of meaning or coherence, sound reveals shape or form or coherence by its resonance, by its interaction with the vessel it fills or the environs by which its movings and reverberatings are shaped. It fills space and time responding to containment and objects encountered by reshaping itself, its tones and rhythms, as it folds back on and harmonizes with itself. Resonators are chambers or oscillators, themselves not sound, but the shapers and enablers of the sonority essential to sound. Sound *re*-sounds and *re*-sonates, with emphasis on the fold of "re." Sound resounds only in encounter.

Inspired by Nancy, we may appreciate that the moving body is an encounter with itself, its nerves and muscles and bones rhythmically interacting in the harmonies and dissonances, the toned bodying, of life. Yet, the living body moves about in encounter with the environment that also serves as a resonating vessel, or nested set of vessels, that amplifies and harmonizes our thrashings about. It is the disruptions of the expected as much as the coherences felt that create the song; a melody comprised of folding and refolding and evolving rhythms and melodies. The sense of the whole (*holos*) is, as Nancy reminds, evident in the remarkable foreknowledge that seems a necessary aspect of listening, suggesting or promising such values as truth or at least beauty.

Since being and moving are inseparable from 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?" (4).

"The echo of the naked figure in the open depths." The shift Nancy suggests is fundamental and particularly appropriate to our current harmonic constructions. Truth, as the resonance shaped by the cistern, is process always unfolding, an echoing of the naked, rather than something static and objective. Rather than integers and geometrical figures and AI probabilities, truth is song being sung, always becoming something other yet an other always anticipated, made possible only through resonating interaction; a process of ear (balance and sound) rather than an object seen (fixed) with the eye. Song is always new, always novel, yet always in some sense already known, always an ongoing recognition.

Truth is in the echoing.[30] We hear our own song, our voice, through echoes; the resounding in our skull as well as in our world. As we know self by encounter with other; this other can be not only the touch of hand or the inner touch of proprioceptively felt movings (the othering that is the mark of our dancing), but also the echoing of our own singing. When we listen to our own song, we 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 zero measure indeed no place at all other than as backfilled. We hear our song—sonorous, echoing, resounding—as a harmonic copresence, heard and felt as the play of coherence and incoherence. Reverberate, resonate, resound, echo—they all explore and reveal the cistern that is primordiality, the deep well of history from which our being and awareness emerge.[31] Sound surrounds and penetrates and returns; sound is without and within,

[30] Massumi also discusses "echo" in *Parables*.

[31] Henri Bergson's notion of *elan vitale* corresponds with reverberation as inspired for him by Eugene Minkowski. See Gaston Bachelard, *Poetics of Space*, xxv-xxvii.

and thus fills space and in its filling reveals its character, quality, and truth. Sound is an aesthetic of impossibles.

When we model truth on sight, the elimination of duration brings clarity. We can snap a picture and indeed the closer we get to a zero interval of exposure, the knife-edge of pure time as linear succession, the more accurate we usually consider the image (Instagram is truth). Yet if we model truth on sound then the approach based on the visual leaves truth empty, a song that is the sound of silence. Truth too must sing and dance. 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 (13).

Nancy describes here what Henri Bergson referred to as "duration," what Husserl called the "living present," and what I have imagined as a "fat present," a rich thick experiential present, a resounding cistern. In the terms of

physics, variations in speeds and elapsed times of sound are its distinctive character—we call it resonance—and, as Nancy suggests, this sonority characterizes our very capacity to sense, the resonance between perceived and perceiver. Sound resounding—sonating and re-sonating—is a forgiving openness that allows the differences in times and characteristics to constitute the play of coherence and incoherence; the resonance is its sense and the awareness of sensing; resonance is equivalent to the "-ing," that alchemical suffix turning of nouns naming objects into a continuous tenses designating moving living actions. It occurs not in the zero time as the integral of some sensual calculus, but rather in a sonorous echoing vessel where time stretches and folds and plays and refuses linear laws as being uninteresting. It fills space in an omnidirectional way. "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" (13). Sound's very nature is an aesthetic of impossibles.

While the 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 do not co-exist; I've suggested the complementarity of local and global. Yet, it is rather clear I think that the concept of time as a succession of points of no dimension is itself a backfilled abstracted gridified mathematized effort to grasp the truth, the metaphysics, the essence by notions of lawful succession of dimensionless points (which obviously cannot be experienced); yet what is lost is the harmony, the experience, the thick richness of vitality. The promise of a new harmony reminds us that we are bodies experiencing ourselves and the world in duration, a fat living present, and that our song is possible only as body and body moving in

the resounding cistern of the universe. Nancy stresses the differences of ear and eye.

> 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 (16, italics in original).

The terms of the new harmony are emerging. The source is the arisen human body not normalized as information but as bodied, that is, living, experiencing, perceiving, improvising. The human body resounds within as inner touch, as tonus. The human body resounds in the vessel of the environment, from the near to the cosmic. The harmony is not a perfect static chord; it is a resonating and emerging composition, a chorale, always unfolding with the many colorations of dissonance and delightful surprises that are essential to its vitality and its characterization as interesting and moving. To the complicated question of what distinguishes dancing many fine answers might be given, yet among them is that dancing is the artful exploration of the potentiality of human movings. While we might dance for many purposes—art, entertainment, fitness, dramatic performance (storytelling), social bonding, protestation, fun—dancing does these things, or nothing external at all, by means of moving that engages the infinite

variations of articulation, tone, and dynamic balance. Despite it creating the world, Nataraja's dancing was done only because dancing was his existence, his being, his life. Dancing is the whole body singing. The resounding is felt in the dancing flesh as it encounters itself and its environment. Dancing is the harmony of flesh and the world.

Bibliography

Ackerman, Diane. *Natural History of the Senses*. 1990

Aczel, Amir. *Why Science Does Not Disprove God*. 2014.

Bachelard, Gaston. *Poetics of Space*. 1958.

Barbaras, Renaud. *Desire and Distance: Introduction to the Phenomenology of Perception*. 2005.

Barbaras, Renaud. "Life and Exteriority." In John Stewart, et. al. (eds.). *Enaction: Toward a New Paradigm for Cognitive Science*. 2010.

Barbaras, Renaud. "Life, Movement, and Desire." *Research in Phenomenology* 38 (2008).

Bernstein, Nikolai A. *The Co-ordination and Regulation of Movements*. 1967.

Bernstein Nikolai A. "On Dexterity and Its Development." In *Dexterity and Its Development*. Eds. Latash, Mark L. & Turvey, Michael T. 1996.

Berthoz, Alain. *The Brain's Sense of Movement*. 2000.

Berthoz, Alain. *Symplexity: Simplifying Principles for a Complex World*. 2010.

Bilton, Nick. "The New Generation of A.I. Apps Could Make Writers and Artists Obsolete." *Vanity Fair* (July 2, 2022).

Bourdieu, Pierre. *Outline of a Theory of Practice*. 1977.

Condillac, Étienne Bonnot de. *Treatise on Sensation*. 1754.

Corballis, Michael. *From Hand to Mouth: The Origins of Language*. 2002.

Crick, Francis Crick. *The Astonishing Hypothesis: The Scientific Search for the Soul*. 1995.

Darwin, Charles. *On the Origin of Species*. 1859.

Dunn, Mary. *Where Paralytics Walk and the Blind See: Stories of Sickness and Disability at the Juncture of Worlds*. 2022.

Edelman, Gerald M. *Second Nature: Brain Science and Human Knowledge*. 2006.

Engels, Friedrich. *Dialectics of Nature*. 1882.
Feigenberg, Joseph M. *Nikolai Bernstein: From Reflex to the Model of the Future*. 2014.
Ferrando, Francesca. "The Body." In Ranisch, R. & Sorgner, S. L (eds.). *Post- and Transhumanism: An Introduction*. 2015.
Gill. Sam. "To Risk Meaning Nothing: Charles Sanders Peirce and the Logic of Discovery." *Creative Encounters, Appreciating Difference*. 2019.
Haken, H. *Synergetics: An Introduction*. 1977.
Hale, Jonathan. "Materiality, Movement & Meaning: Architecture and the Embodied Mind." Proceedings of the 6th Annual Architectural Research Symposium in Finland. 2014: 305-14.
Hansell, Gregory R. and William Grassie (eds.). *H± Transhumanism and Its Critics*. 2010.
Hayles, N. Katherine. *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics*. 1999.
Hayles, N. Katherine. "Wrestling with Transhumanism." In Hansell, Gregory R. and William Grassie (eds.). *H± Transhumanism and Its Critics*. 2010.
Held, R. and Hein A. (1963). http://embodiedknowledge.blogspot.com/2011/12/classic-experiment-by-held-and-hein.html
Heller-Roazen, Daniel. *The Inner Touch: Archaeology of Sensation*. 2009.
Kelso, J. A. Scott. *Dynamic Patterns: The Self-Organization of Brain and Behavior*. 1995.
Kelso, J. A. Scott and David A. Engstrøm. *The Complementary Nature*. 2006.
Kendon, Adam. *Gesture: Visible Action as Utterance*. 2004.
Kuhn, Thomas. *The Structure of Scientific Revolutions*. 1962.
Lakoff, George & Mark Johnson. *Metaphors we Live By*. 1980.
Lakoff, George & Rafael E. Núñez. *Where Mathematics Comes From*. 2000.
LeDoux, Joseph. *The Emotional Brain: The Mysterious Underpinnings of Emotional Life*. 1996.
LeDoux, Joseph. *Synaptic Self: How Our Brains Become Who We Are*. 2002.
Leroi-Gourhan, André. *Gesture and Speech*. 1993.
Levin, Michael & Rafael Yuste. "Modular Cognition." *Aeon*. March 8, 2022.

Libet, Benjamin. "Do We Have Free Will?" *Journal of Consciousness Studies*. 1999.c
Lightman, Alan. "Life is an Accident of Space and Time." *The Atlantic* September, 2022
Lightman, Alan. *Probable Impossibles: Musings on Beginnings and Endings*, 2021.
Maine de Biran (François-Pierre-Gontier de Biran). *Essays on the Division of Thinking*. 1804.
Massumi, Brian. *Parables for the Virtual: Movement, Affect, Sensation*. 2002
Mauss, Marcel. "Techniques of the Body." *Sociologie et anthropologie*. 1936.
Merleau-Ponty, Maurice. *The Visible and the Invisible*. 1968.
Nancy, Jean-Luc. *Listening*. 2007.
Noë, Alva. *Out of Our Heads: Why You Are Not Your Brain, and Other Lessons from the Biology of Consciousness*. 2010.
Noland, Carrie. *Agency & Embodiment*: *Performing Gestures/Producing Culture*. 2009.
Patočka, Jan. *Le Monde naturel et le movement de l'existence humanine*. 1988.
Rich, Simon. "The New Poetry-Making Machinery: Shall code-davinci-002 Compare Thee to a Summer Day?" *The New Yorker*. June 21, 2022.
Rose, Steven. *The Future of the Brain: The Promise and Perils of Tomorrow's Neuroscience*. 2005.
Rushdie, Salman. "Ask Yourself Which Books You Truly Love." *New York Times*. May 24, 2021.
Satel, Sally and Scott O. Lilienfeld. *Brainwashed: The Seductive Appeal of Mindless Neuroscience*. 2013.
Scarry, Elaine. *The Body in Pain: The Making and Unmaking of the World*. 2007.
Schiller, Fredrich. *On the Aesthetic Education of Man*. 1495.
Seabrook, John. "The Next Word: Where Will Predictive Text Take Us?" *The New Yorker*. October 14, 2019.
Serres, Michel. *Variations on the Body*. 1999/2011.
Sheets-Johnstone, Maxine. *The Primacy of Movement*. 1999, 2nd ed 2011.
Shelley, Mary. *Frankenstein: A Modern Prometheus*. 1818.
Sherrington, Charles Scott. *The Integrative Action of the Nervous System*. 1906.

Stern, Daniel. *Forms of Vitality: Exploring Dynamic Experience in Psychology and the Arts*. 2010.
Stern, Daniel. *Interpersonal World of the Infant: A View from Psychoanalysis and Developmental Psychology*. 1985.
Tallis, Raymond. *The Hand: A Philosophical Inquiry into Human Being*. 2003.
Thelen, Esther & Linda B. Smith. *A Dynamic Systems Approach to the Development of Cognition and Action*. 1994.
Vasseleu, Cathryn. *Textures of Light: Vision and Touch in Irigaray, Levinas and Merleau-Ponty*. 1998.
Villiers de L'llise-Adam. *Tomorrow's Eve*. 1886.

Sam Gill's Recent Book Publications

Religion and Technology into the Future: From Adam to Tomorrow's Eve. Lanham, MD: The Rowman & Littlefield Publishing Group, Inc., 2018

Creative Encounters, Appreciating Difference: Perspectives and Strategies. Lanham, MD: The Rowman & Littlefield Publishing Group, Inc., 2019

On Reflection: Vignettes & Images. Self-published in two-versions, 2019

Dancing Graffiti: Stories from my Life. Self-published, 2020

The Proper Study of Religion: Building on Jonathan Z. Smith. New York: Oxford University Press, 2020; winner American Academy of Religion's 2021 Award for Excellence in the Study of Religion in the category of Analytical-Descriptive Studies

Looking Forward in the Rearview Mirror: Travel Journal Selections with Reflection. Self-published. 2021

Travel Writings: The Full Travel Journals: 1993-1994 Australia, Bali, Java, Thailand, Nepal; 1997 Ghana West Africa. Self-published, 2021

On Photography. "Aesthetic of Impossibles" ArtBook Series. Self-published, 2021

Photo Art Album 2022. Self-published, 2022

Art Album 2023: Photos & Essays, 2023

Sam Gill's Recent Article Publications

"Moving: The Core of Religion," *Body and Religion*, 1.2, 2018 131–147

« Jonathan Z. Smith, ou la duplicité nécessaire » *Asdiwal* 13 (2018): 53-60

"Jesus Wept, Robots Can't: Religion into the Future," *Body and Religion* 4.1, 2020 32-44

"Jonathan Z. Smith and the Necessary Double-face" In Emily D. Crews and Russell T. McCutcheon (eds.), *Remembering J. Z. Smith: A Career and its Consequences* (Sheffield, UK: Equinox Publishers, 2020), 100-108

"Forward" to *Native American Myths and Tales* (London: Flame Tree Publishing Ltd., 2020)

"Imagining a Proper Academic Study of Religion Inspired by Jonathan Z. Smith" In *Thinking with J.Z. Smith: Mapping Methods in the Study of Religion, ed. Barbara Krakowicz (NAASA Working Papers, Sheffield, UK: Equinox Press, 2023), 22-33*

"'What the One Thing Shows Me in the Case of Two Things': Comparison as Essential to a Proper Academic Study of Religion" *Method and Theory in the Study of Religion*, 2021 1-19

"The Glory Jest and Riddle: Jonathan Z. Smith and an Aesthetic of Impossibles" *Numen* 70 (2023) 447–472

"What is Mother Earth? A Name, A Meme, A Conspiracy," Responses by Bjorn Ola Tafjord, Olle Sundström, Greg Johnson, Matthew Glass, Joseph Wilson with comments by Gill *Journal for the Study of Nature, Religion, and Culture* (forthcoming)

"Dancing Lessons: A Biological & Philosophical Account of Human Distinctiveness as Relevant to the Proper Study of Religion" in Papers from "Moving Body as Foundational to the Proper Study of Religion: A Response to and Celebration of the work of Sam Gill" AAR/NAASR, Denver, November 20, 2022, Papers to be published in *Body $ Religion* (forthcoming)