The Primacy of Movement

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The Primacy of Movement. Expanded second edition
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Expanded second edition

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To Dmitri and Kevin
with immeasurable love
and with gratitude
for enriching my life immeasurably

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Preface to the expanded second edition

This second edition of *The Primacy of Movement* contains an additional section with two new chapters. The added fourth section, titled "Twenty-First Century Reflections on Human Nature: Foundational Concepts and Realities," takes contemporary research findings in cognitive science and philosophy and in neuroscience into detailed account. Not surprisingly, it sets these findings in the context of movement, most pointedly in the context of the concluding statement in the original edition to the effect that any time we care to turn our attention to movement — and to our fundamental capacity to think in movement — there it is.

The new Chapter 13 provides both a constructive and critical path toward these expanded understandings of movement by showing how animation is the fundamental, essential, and properly descriptive concept for understandings of animate life. It does so by considering affectivity as a staple of animate life, elucidating both its biological and existential foundation, and illuminating its integral dynamic relationship to movement. The chapter originally appeared in 2009 as an article in *Continental Philosophy Review*. Minor changes have been made in the article in adapting it to this book. I thank Springer Publications for their permission to include the article here.

The new Chapter 14 follows up conclusions reached in the chapter on animation. It does so by way of an extended interdisciplinary inquiry into movement from three perspectives: mind, brain, and the conceptually reciprocal realities of receptivity and responsivity as set forth in phenomenology and evolutionary biology, respectively. It follows up these three perspectives with an Afterword on kinesthesia, and this in order to point up the incontrovertible significance of the faculty to cognition and affectivity and its egregious omission in contemporary disquisitions on "embodiment," "motoric functions", an "enactive approach," and the like, in other words, in contemporary research and writings on putatively living — or lived — bodies. The overall inquiry poses — and answers — the question that constitutes the chapter's title: "Embodied Minds or Mindful Bodies? A Core Twenty-First Century Challenge." With respect to each perspective, and as in the preceding chapter, a constructive and critical path is taken in the analysis and discussion of the issues involved, the central issue being a recognition of movement to begin with.

The necessity of recognizing movement should actually be obvious to anyone bent on understanding the nature of animate life and in particular the animate nature of human nature. In a quite literal sense the recognition of movement is a *re-cognition* of what is there and has been there from the phylogenetic and ontogenetic beginnings

of life onward: a life-defining animation and its experienced qualitatively-unfolding dynamics. However muted in adult life, the actual experience of movement — both kinesthetic in self-movement and kinetic in the movement of others — is not only correlated with a neurophysiological complexity, but is itself kinetically, affectively, and cognitively complex. In a sense, many present-day cognitivists and neuroscientists seem to think the actual experience of movement is beneath them, and indeed, in a certain sense it commonly is: it is there in their striding legs and swinging arms, in their stoopings to pick up a suitcase, in their bringing a fork to their mouth. But it is just as commonly there at their desk: in their diligent computations of distance and speed, in their logically or causally formulated phenomenal relationships and invariants, in their observationally-tethered assessments of pathologically disturbed individuals, in their laborings through the design of an experiment, in their hesitancy or swiftness to certify a certain conclusion. In short, the complex dynamic dimensions of movement anchor the very so-called "acts" and "actions" of contemporary cognitivists and neuroscientists in ways no different from the way they anchor everyday experiences of humans in the everyday lifeworld.

I thank editors at John Benjamins Publishing for their eagerness to publish an expanded second edition. The book provides a further opportunity not just to prominence movement but to show how much there is still to learn from movement, thus how open-minded our inquiry into movement — real-life animate movement — can be.

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Introduction

This book is about movement. It is about the necessity of incorporating movement in our epistemological and metaphysical investigations of the animate world from the very beginning, and in our scientific and historical investigations of the animate world as well. It is about how this necessity derives from corporeal matters of fact that define our lives from infancy onward and that, in an evolutionary sense, define the lives of all animate forms. It is about learning to move ourselves. It is about how movement is at the root of our sense of agency and how it is the generative source of our notions of space and time. It is about how self-movement structures knowledge of the world — how moving is a way of knowing and how thinking in movement is foundational to the lives of animate forms.

This book is correlatively about recent accounts of knowledge, cognition, and life that ignore or minimize the central importance of movement. In particular, its concern is to examine in a carefully critical manner those cognitivist accounts of mind — or consciousness — that bypass an understanding of actual living bodies — what dynamic systems theorists term "real-time" bodies in "real-time" environments. Not uncommonly, these accounts bypass living bodies for much the same reason that they reduce minds to matter. Indeed, on the one hand, as if the mechanization of our bodies were not enough, we now have a twentieth-century made-in-the-West mechanization of minds; on the other hand, as if the mind/brain problem were not enough, we now have a twentieth-century made-in-the-West body/brain problem, a problem created by an errant reduction of living bodies to the neurophysiological matter located at their head-end. This book spells out basic ways in which such accounts are misguided, how fundamental errors accrue to construals of ourselves that belie our animate heritage. It attempts to reinstate what Thomas Huxley termed "man's place in nature" by recalling that we ourselves are a form of life and that to take ourselves seriously as a form of life is first and foremost to take the evolution of animate forms seriously. When we do so, we see that animation is at the very core of life, and that a deeply reflective study of natural history and a deeply reflective study of infancy are equally mandatory.

This book is furthermore about notable contributions made by philosophers and scientists either directly or indirectly to an understanding of movement — particularly Edmund Husserl, Aristotle, Hermann von Helmholtz, Roger Sperry, Wilder Penfield, and more recently, infant/child psychologists Daniel Stern, Esther Thelen, and Andrew Meltzoff. Husserl and von Helmholtz, for example, came independently to discover a central epistemological dimension of movement. Each came upon the dimension

by examining his own everyday experiences of being a body — an "animate organism" as Husserl termed it. Aristotle figures in equally important ways on the basis of his abiding concern with movement, a concern stemming from his observations of the natural world and from his basic insight that motion is the fundamental principle of nature. Given his recognition of this principle, it is not surprising that movement had as sizable a significance for his understanding of *anima* — the soul — as for his understanding of cosmology.

Philosophers and scientists whose writings center on the body but who come up short of a recognition and comprehension of the primacy of movement are of considerable significance too. Critical analyses of the writings of philosopher Maurice Merleau-Ponty and of psychologist J.J. Gibson, for example, bring to light blinders of thought that preclude an appreciation of the foundational phenomenon of animation and the significance of kinesthesia to both a proper ontology and a proper epistemology. The blinders serve as a heuristic in the present endeavor. They alert us to possible conceptual hazards: the hazard of thinking of bodies in the abstract, for example, rather than in the fine sensory-kinetic terms demanded by corporeal analyses; the hazard of instrumentalizing movement to the point that kinesthetic awarenesses are overlooked as a form of knowledge, and in turn, dynamic qualities of movement are left behind and unattended; the hazard of being tradition-bound or skittish rather than neutrally attentive to, and patiently observant of, one's own everyday experiences of movement.

In general, present-day philosophers and scientists begin their studies of mind, consciousness, and related topics from the viewpoint of perception, especially visual perception, movement being seldom accorded equal time or viewed with equal seriousness. "Output," for example, is typically considered simply a response to what is crucial, namely, information. Two commentaries implicitly point up the value of a quite different research strategy. At the Pontifical Academy of Science Study Week meeting held in Italy in 1964, an impressive international group of scientists gathered to discuss topics related to mind-brain matters. Physiological psychologist H.L. Teuber (1966: 440–41), remarking on a paper concerning "the controlling function of the brain in voluntary agency" and its relationship to the question of free choice, commented that "[W]e always start at the sensory end and try to come out at the motor side. I very much agree with the late von Holst when he suggests that we start at the other end and work our why (sic) back toward sensation. … It requires some different way of looking." David Bell, in the final chapter of his book on Edmund Husserl's philosophy (1990: 215), points out that the reader who has followed his discussion from the beginning is now a long way "from the philosophical vision [anchored in object perception] which predominates in *Ideas* and Husserl's other middle-period works." He goes on to specify that "[t]he pure ego has been transformed into a physical, sentient organism, a human being; the cogito

has been replaced by something capable of 'kinaesthesis'; the single perceptible object has made way for an integrated perceptual field, or environment; and the original phenomenological method has been broadened to become something Husserl at one point calls 'the phenomenological-*kinetic* method'" (Bell's italics).[1] A parallel line of thought is evident in these commentaries that is quite remarkable and that follows from the fact that, although a matter of two distinct fields, scientists and philosophers alike have been, and are, commonly disposed to begin their studies from the same perspective. In its own way, each commentary intimates that there is a liability in the approach. As Teuber suggests, when the question of agency is not addressed from the perspective of movement, and as Bell suggests, when perception is not diligently and rigorously pursued to its full dynamic, something crucial is omitted. The liability is in fact clearly visible, one might even say palpable, in the waning years of the twentieth-century Western world and in the burgeoning years of this twenty-first century one. The de-animation of perception and the rise of cognitive science in the past four decades have progressively and strikingly brought the liability to the fore in the form of both information-computational modelings and neurological reductions.

The purpose of *The Primacy of Movement* is essentially to reverse direction, to shift the perspective from which both epistemological and metaphysical — and scientific and historical — studies commonly proceed. It is to demonstrate that movement offers us the possibility not only of formulating an epistemology true to the truths of experience, but of articulating a metaphysics true to the dynamic nature of the world and to the foundationally animated nature of life. The reversal requires not just a corporeal turn, a turn I described in *The Roots of Thinking* (1990) and set forth in multiple perspectives in *The Corporeal Turn: An Interdisciplinary Reader* (2009), but a particular kind of corporeal turn. The basic corporeal/linguistic comparison that I originally drew, however, still holds; that is, like the linguistic turn initiated independently by philosopher Ludwig Wittgenstein and anthropologist Claude Lévi-Strauss, a corporeal turn calls upon us to attend to something long taken for granted. In the present instance, it asks us to be mindful of movement. It thus asks us first of all to be silent, and, in our silence, to witness the phenomenon of movement — our own self-movement and the movement of all that is animate or animated in our surrounding world. It asks us consequent to these experiences of movement, to reflect upon the nature of animation and to discover the epistemological character of the dynamics we find inherent in the qualitative play of forces that constitute our own movement and the movement of all living forms. It asks us to language these experiences and to come to know them in ways that are phenomenologically consonant with the dynamically resonant kinesthetic and kinetic experiences they are; indeed, it confronts us with this task. The enterprise is demanding not only in itself. It is demanding because it asks us to renounce what amounts to received ignorance: biased inattentions to and facile

trivializations of movement. In acceding to the demands of a corporeal turn toward movement, we have the possibility of bringing to light an extraordinary terrain. As the linguistic turn in the twentieth century led to profound new insights, so a turn toward the animate will assuredly do no less.

Given the scope of this book, I would hope that the detailed synopsis of each chapter that follows will give the reader not just advance notice, but a solid sense, of the topics covered and the range of their discussion.

The Primacy of Movement begins with a section on Foundations. In particular, it begins with a critical analysis of the controversy over the status of Neandertals vis à vis *Homo sapiens sapiens* — modern-day humans. The purpose of this beginning chapter is certainly not to resolve the controversy, but to show how, by attention to animate form and to corporeal matters of fact, not only deeper but evidentially sound understandings may be had of the hominids in question. Detailed critical analysis of a book on Neandertals and of its estimable review by Stephen Jay Gould shows how paleoanthropological conceptions of Neandertals and modern-day humans are radically skewed by the great Western mind/body dichotomy. Low-life bodies and high-life minds each have, and have had, their appointed and distinctive places in the annals of paleoanthropology. As an alternative to downplaying the mental in Neandertals and elevating the symbolic in modern-day humans in such ways — or more critically put, rather than making attributions that are conceptually muddled because they are projections of one's own biases rather than descriptive of the things themselves — the chapter demonstrates the possibility of questioning the dichotomy that anchors the assessment in the first place. It thereby shows how, through patient analyses of what paleoanthropologists variously term "symbolic behavior" and "mental symbolization," one arrives at patterns of analogical thinking that are rooted in bodily life. In finer terms, it shows the conceptual significance of movement through detailed analyses of kinetic dispositions based on morphology. It shows that thinking is modeled on the body (Sheets-Johnstone 1990) and that what Gould (1994: 27) calls "remarkable mental adaptations" are grounded in animate form. It shows that technological differences are readily translated into animate bodily terms, that what is basic to paleoanthropological understandings are understandings of the relationship between bodies and movement, and hence, that our understanding of individuals other than ourselves depends upon our capacity both to imagine ourselves along different corporeal lines, and to trace out what it means to live kinetically and conceptually along those lines. Solid corporeal-kinetic foundations are basic to historical understandings, which is to say to historical reconstructions of our hominid past.

Chapter 2 carries forward the basic theme of elucidating the animate. The chapter has two parts. Part I is devoted to a natural history of consciousness. It lays out this history in terms of animate form, showing consistently from its introductory paragraphs to its concluding ones that the question of "how consciousness arises in

matter" (Nagel 1993: 40)[2] is a misconceived question. In particular, it critically assesses reductively materialist renditions of consciousness, notably the renditions of philosophers Paul Churchland and Daniel Dennett; it takes responsivity seriously as "a fundamental and almost universal characteristic" of life (Curtis 1975: 28); it shows in turn how the common practice of using textual markings to differentiate among cognitive capacities in living organisms is without justification; it sets forth at length how the Socratic imperative "know thyself" is a built-in biological matrix that has its evolutionary roots in proprioception; it specifies how the surface recognition sensitivity of protists and bacteria is definitive of a consciousness of something outside oneself — a meta-corporeal consciousness of the chemical constitution of the environment, for example; it specifies how animate forms from the earliest invertebrates are structured in ways that are sensitive to movement, thus how, with respect to the animal kingdom, consciousness is fundamentally a corporeal consciousness and the movement of organisms is fundamentally commensurate with their essentially tactile, proprioceptive, and/or kinesthetic sensitivities; it presents evidence showing that external organs of proprioception were internalized in the course of evolution, thus eventuating in a kinesthetically-tethered corporeal consciousness, and further, how these internally-placed organs constitute an epistemological gateway, a gateway holding open the possibility of more complex affective and cognitive lives; it thus demonstrates how in truth what Dennett (1991: 412–30) calls "The Reality of Selves" has its roots not in words but in corporeal consciousness. Through all of its critical assessments, questionings, and analyses, Part I shows how, by paying attention to corporeal matters of fact as they are articulated in the natural history of life, and by hewing to sensory-kinetic analyses of these corporeal matters of fact, one is led inexorably to understandings of consciousness that are rooted in animate form. It concludes by briefly identifying three implications, the first having to do with received wisdom concerning the chronological relationship of unconsciousness to consciousness; the second with a present-day mesmerization by brains to the exclusion of a serious in-depth attention to natural history; the third with armchair pronouncements — upon consciousness and upon creatures such as lobsters and scallops — that issue from philosophical ivory towers and that lack all semblance of an informed evolutionary backbone.

Part II deepens the understanding of consciousness as arising in animate form by defending the basically Aristotelian propositions that our account of perception should accord with our own essentially qualitative experiences of perception, and in turn, that a proper metaphysics should be consonant with living things in their processes of generation, growth, decay, movement, and rest. It thus questions philosopher Myles Burnyeat's (1992: 26) claim that "To be truly Aristotelian, we would have to stop believing that the emergence of life or mind requires explanation," his general thesis being that twentieth-century humans are inevitably and rightfully "stuck with the mind-body problem as Descartes created it" and by extension,

stuck with a conception of matter "as physics and chemistry describe it" (22). The chapter critically examines certain assumptions underlying Burnyeat's claim — the idea that perception is reducible to twentieth-century physics and chemistry, for example, the idea that sense organs are opening conduits to brains — and by this route arrives at a properly Aristotelian understanding of perhaps the most discussed sentence in Aristotle's account of perception; namely, his famous statement (*De Anima* 424a18–21) that "a sense is what has the power of receiving into itself the sensible forms of things without the matter." The critical examination takes seriously the epigraphs from Aristotle's writings quoted at the beginning of Part II. Each epigraph states in unmistakable terms that to understand nature is to understand motion, for nature — by its very nature — everywhere articulates a principle of motion. To understand perception is thus to understand a dynamic event; in particular, it is to understand the kinetic process by which we take in the sensible form of things without the matter and thereby experience qualities such as loud, sharp, soft. In effect, Part II shows that what Aristotle is describing is the process by which we experience a world not of objects *as such*, but a world of varied and changing physiognomies, a qualitatively dynamic world. His essentially experiential, kinetic, and qualitative explication of perception draws on his understanding of perception as sensorially localized: we perceive at the site of our senses. It draws equally on his understanding of sensation as a change of quality, and of change of quality as a matter of movement. In essential respects, his explication adumbrates a process metaphysics, a metaphysics substantively at odds with a metaphysics of matter "as [twentieth-century Western] physics and chemistry describe it," and equally at odds with a metaphysics that is qualitatively opaque and experientially blind. Acknowledging Aristotle's recognition of movement as the foundational principle of nature — a principle confirmed by his astute observation (*Metaphysics* 1071b30) that "Matter will surely not move itself" — we find it cogent to ask which is the more basic metaphysical question: why is there something rather than nothing?; or, why is there movement rather than stillness?

In its phenomenological analysis of kinesthetic consciousness, Chapter 3 sets forth foundational epistemological structures of movement, thus deepening in decisive ways our understanding of consciousness as arising in animate form. The analysis discloses four primary qualities of movement: tensional, linear, amplitudinal, and projectional. The qualities, all of them created by movement, are experienced directly any time we care to pay attention to our own movement — or to the movement of others — and to notice them. The qualities are in fact the source of those kinesthetic regularities and expectations that are foundational to our sense of agency and to our repertoire of "I cans."[3] They are there from the start in our primal kinetic sense-makings and spontaneities. They are there in our first consciousness, a tactile-kinesthetic consciousness of our own bodies in movement. Movement is indeed "the mother of all cognition."[4] It forms the I that moves before the I that moves forms movement. It is

the foundation of our conceptual life, that is, the foundation of an ever-growing store of corporeal concepts, concepts such as 'inside', 'heavy', 'light', 'open', 'close', concepts having to do with consequential relationships, and so on. The chapter lays out these rich, subtle, and varied conceptual dimensions of movement and goes on to specify in detail how the challenge of coming to an awareness of the primacy of movement involves us not only in actually moving and becoming kinetically aware of ourselves in everyday happenings such as walking, sneezing, and breathing, but in exemplifying for ourselves — in both Husserlian and von Helmholtzian terms, *bringing to self-evidence* — the cardinal epistemological structures of kinesthetic consciousness. Cardinal structures constitute *qualitative* dimensions of movement. A beginning analysis of the temporal dimension of movement exemplifies the qualitative nature of these cardinal structures and shows specifically how an examination of felt qualitative experiences such as "sudden," "rushed," "fleet," "attenuated," — all temporal qualities of movement — opens up into a phenomenology of the primordial constitution of time. It thereby shows how, as originally experienced, time is not fundamentally akin to the notes of a melody, one note strung out after the other in ordinal before-now-after fashion, but is an unfolding qualitative dynamic.

Appended to Chapter 3 is an Afterword that shows how, in their investigations of qualia, philosophers pay near exclusive attention both to the color red and to pain. Indeed, they use both as paradigms of qualia and disregard the most fundamental qualia of all, the qualia of proprioception and kinesthesia. To virtually all philosophical accounts, the latter are non-existent. The Afterword shows the fatuity of this myopic practice through an analysis of a somewhat classic philosophical thought experiment concerning a person — Mary — who has been brought up in, and is confined to, a wholly black-and-white-world, who is *thoroughly knowledgeable* in every respect about the physical nature of the world, but who, on being let out of her black-and-white room, is confronted with the color red. Philosophers argue contentiously over the proper epistemological interpretation of her being so confronted. Careful critical analysis, however, shows that the thought experiment is incoherent; it is incoherent because Mary is an inconceivable person. Though being putatively able to introspect her own brain states, for example, and to understand propositions such as "the hypothalamus is underneath the thalamus" or "electrical forces push sodium ions inward," Mary is in fact thoroughly dumb to her own body, thus necessarily dumb to what it means to be *underneath*, or what *pushing* or *inward* mean. Lacking kinesthetic experience of her own moving body — being limited to introspection of her brain states on the one hand, and to printed words on a page and images on a television screen on the other — she lacks the requisite foundation for knowledge, let alone for *total* knowledge, about the physical nature of the world. One might say that confrontation with the color red should be the last if not least of philosophers' worries.

The second section of the book is devoted to Methodology. Its first chapter examines in methodological terms the complementary findings of twentieth-century

philosopher Edmund Husserl and nineteenth-century physicist-physiologist Hermann von Helmholtz with respect to perception. The examination shows how, though their points of departure are far removed from one another, their accounts of perception overlap and validate each another: both accounts underscore the central role of self-movement in perception, the essential role of introspection, and the importance of self-evidence — consulting one's own experiences as one would consult data gathered in a laboratory. The methodological practice of free variation — imagining the possible — a practice consistently evident in von Helmholtz's extended concerns with the axioms of geometry, and of course an essential step within Husserl's phenomenological methodology, is a further point of confluence, one that has sizable epistemological import. The broader purpose in demonstrating the methodological concordances is to exemplify how a trans-disciplinary communal task is possible, thus how a rich and integral epistemology is possible. The chapter shows how scientific and phenomenological research can complement one another, not only because a phenomenological methodology entails practices familiar to scientists, but because the truths of experience are as proper an aim of science as the truths of behavior. Moreover it shows in detail how fundamental differences in scientific and phenomenological practice enhance the complementarity. Introspection, for example, as practiced in the natural attitude by a scientist is not the same as introspection practiced within the phenomenological reduction. As a result, descriptions of phenomena — perceptual phenomena, for example — are different. The chapter shows how the possibility of a communal task is not thereby jeopardized but on the contrary, epistemologically enriched. The chapter proceeds to exemplify how dominant present-day ideologies militate against the very idea of a trans-disciplinary task by presenting a brief critical analysis of a phenomenologist's inquiry into the relationship between connectionism and phenomenology, specifically into the way in which a connectionist construal of mind might benefit phenomenology. The analysis shows that both the ahistoricity of connectionism and its perseveration of the mind/body dichotomy are obstacles to a salutary relationship. The chapter concludes by suggesting an alternative to a connectionist construal of mind, an alternative that has its roots in dynamic systems theory and is exemplified by the research of neurophysiologist Gerald Edelman and by contemporary researchers in infant/child developmental psychology. The alternative construal is historical in both a phylogenetic and ontogenetic sense; it recognizes the centrality of movement and in consequence leaves neither bodies nor kinesthesia behind; and it holds the promise of carrying forward the trans-disciplinary task adumbrated in the work of both Husserl and von Helmholtz.

The succeeding chapter, "On Learning to Move Oneself," attempts to spell out a methodology in the process of practicing it, namely, a constructive phenomenology of infancy and childhood that, by the very nature of the topic, defines a trans-disciplinary task: an ongoing consolidation of phenomenological and scientific research and findings

that elucidate in ever deepening ways how movement is our mother tongue. Taking the fact that we all must learn to move ourselves as a methodological clue, the chapter presents a phenomenological account of what it means to be movement-born, an account of both the phenomenon of primal animation and of our common kinetic apprenticeship. It shows how, by proceeding with a definition of movement as change of position or with a description of movement in terms of an object in motion, one compromises a clear understanding of the kinetic phenomenon itself. It shows that such notions are tied to an unfiltered natural attitude and that, contrary to these notions, movement is first of all the mode by which we make sense of our own bodies and by which we first come to understand the world. It shows, in effect, how we forge a kinetic bond with the world on the basis of an originary kinetic liveliness, how incipient intentionalities play out along the lines of primal animation, and thus how our tactile-kinesthetic bodies are epistemological gateways. In addition to setting forth this account through the method of a constructive phenomenology, the chapter clarifies methodological relationships — in particular, how phenomenology utilizes facts as transcendental clues — and addresses various methodological issues — in particular, how what is commonly referred to as "the background" is not forever hidden away unless or until some untoward happening brings it to light, but that it is accessible through phenomenological analyses. In providing a constructive phenomenology of our originary animation, the chapter shows how psychological findings on infancy complement and support phenomenological ones. Psychological research studies show, for example, that infants respond preeminently not to moving objects but to movement; they show forcefully if indirectly that thinking in movement is an infant's original mode of thinking, that as infants, we come to grasp objects, literally *and* epistemologically, through movement; they validate a resonant tactile-kinesthetic body and kinesthetic consciousness. At the same time, psychological research studies challenge the discipline of phenomenology to articulate a phenomenology of change, a phenomenology that spells out, for example, how changing kinetic possibilities re-define a whole — a whole lively being and way of being. By highlighting how a constructive phenomenology of learning to move oneself requires attention to the phenomenon of emergence — how shifting patterns within a complex dynamic eventuate in new possibilities and how these new possibilities engender new relationships among all constituents of the whole — the chapter shows how an understanding of the phenomenon of learning to move oneself requires a readiness to cross disciplines and to engage oneself not only in a communal task but in an ongoing one whose end is nowhere in sight.

Chapter 6 focuses close and critical attention on the methodologies generating Maurice Merleau-Ponty's philosophy. It does so for multiple reasons, each of considerable import: Merleau-Ponty's philosophy is commonly taken to be a philosophy of our *embodied* humanness, hence a philosophy that should lead us to foundational corporeal-kinetic truths; his philosophy is neither presented as, nor taken to be, a

speculative philosophy, hence it is a philosophy we should have a way of both verifying and of carrying forward in further enlightening ways; his philosophy attempts to reconcile philosophic truth with scientific fact, hence it is a philosophy that aims in the direction of a trans-disciplinary task. In view of these reasons, a concern of major significance is whether we can follow along the same methodological paths as Merleau-Ponty. Accordingly, the framing question the chapter asks is the seemingly simple methodological question, "How does Merleau-Ponty do what he does?" What follows is literally an inquiry: question follows upon question; answers are provided only provisionally in the form of further, self-generated questions. The point of the persistent questioning is to trace out the methodological underpinnings of a philosophy that, precisely because it is a philosophy of our humanness, should be methodologically transparent to us. The point of the questioning is thus neither to try the patience of the reader nor to produce a rhetorical exercise. In pursuing answers to the framing question, the chapter attempts to encompass Merleau-Ponty's philosophy, spanning (though not in chronological order) his work from *The Structure of Behavior* to *The Visible and the Invisible*. It begins by examining his use of pathology: Can empirical facts (about pathology) lead to existential facts (about the normal)? The questioning proceeds in the direction of clarifying how the factual enters into the philosophical and continues into an examination of the fundamental liability of a fact-based ontological methodology. It moves on to confront Merleau-Ponty's seeming problematic in distinguishing between fact and experience and between fact and reflection. In this latter context, considerable effort is made to elucidate Merleau-Ponty's statement (1968: 65) that radical reflection "[is] founded on the fact that I am no stranger to myself." Considerable attention too is paid to his denigration of introspection — on the grounds that it is a practice repudiated by science — insofar as introspection appears incontrovertibly to be the source of his radical reflections. In a further attempt to clarify the nature of his methodology, the chapter turns to an investigation of his last writings in the light of his earlier work, asking, for example, whether both "hyper-reflection" and "perceptual faith" as designated in *The Visible and the Invisible* (1968) are not related to his expressed thesis in *Phenomenology of Perception*, i.e. that philosophical analysis of our relationship to the world is futile, that "philosophy can only place [our relationship to the world] once more before our eyes and present it for our ratification" (1962: xviii). The methodological question of a linguistically-attuned philosophy as set forth in *The Visible and the Invisible* (1968: 125) — a philosophy in which words "would combine … by virtue of a natural intertwining of their meaning," that is, a philosophy in which language speaks the philosopher — is also addressed. Expressly in view of the unresolved tension between nature and ontology in his philosophy, the questioning moves to an interrogation of his specification of a natural bond with the world. The chapter offers two tentative conclusions, one general and one particular, about Merleau-Ponty's methodologies and their implications. It concludes with an optional epilogue that in essence ponders

key conceptual correspondences — all of them having to do with the nature of the body and of bodily life — between the ontology of Merleau-Ponty and themes in the writings of poet-prose essayist Paul Valéry.

Chapter 7 is a methodological postscript, an inquiry into both the nature of wonder and the place of wonder in philosophy, specifically, in contemporary American philosophy which, in its strongest and most pervasive guise, seems to have given up all but lip service to wonder. If, on the contrary, wonder is at the heart of philosophy as Plato and Aristotle claimed, then it is of inestimable methodological significance in both generating and fueling the practice of philosophy. In this methodological context, I consider the timelessness of wonder, tying its timelessness to the potential of an individual philosophic act to be part of a communal and infinite task; I consider wonder in the deep sense — the feeling that centers not on wondering what to wear or why the faucet is leaking — but on wondering about death, violence, friendship, memory, and so on; I consider the way in which present-day Western science annihilates wonder by writing promissory notes on its own epistemological and metaphysical behalf and how seductive and beguiling these promissory notes are and how they lead us away from a communal and infinite task; I consider how we lose sight of the fact that to liberate ourselves methodically from ignorance, we must practice philosophy close-up, which means allowing a place for both the fear and longing that are at the heart of the feeling of wonder; I consider how, when we do so, we discover that the professional is personal, and how we are then engaged in a passionate act generated and sustained by a deep and powerful feeling having the possibility of leading us to wisdom.

Five chapters comprise the last section of the book titled Applications. The common thematic underlying each of the chapters is animation: a moving, flesh and bone subject; a moving, acting organism; a moving, sense-making creature; a moving, thinking being. The corollary common thematic is the necessity of taking this subject, organism, creature, and being into epistemological and metaphysical, scientific and historical account.

Chapter 8, "On the Significance of Animate Form," shows how fundamental creaturely meanings derive from animate form, that is, how the animate is not arbitrary. The chapter illustrates concretely the semantic specificity of living bodies, showing in the process how the anatomical organization of our body is not a blank cultural blackboard open for scripting, but a phylogenetically rich and complex density of meanings. It goes on to show in detail how the terms "embodiment" and "lived body" compromise the semantic specificity of living bodies, and correspondingly, how the term "animate form" captures in a more exacting way what we actually experience when we experience our own bodies and the bodies of others: animation, aliveness, dynamically changing conformations and contours, qualitatively meaningful forms — and, by extension, a spatio-temporal world co-terminus with that experienced animation and aliveness, those dynamically changing contours, and so on. The chapter shows further how the term *animate form* brings to the fore elemental facts

of our human aliveness, not only that we have a front and back, for example, or that we move more easily forward than backward — aspects of our bodily being that philosopher Hubert Dreyfus and anthropologist Paul Rabinow call attention to as highly significant invariants omitted in the philosophies of Michel Foucault and Maurice Merleau-Ponty — but that we have an evolutionary history. *Animate form* places us rightfully in the context of a natural history, a history that we tend to minimize, ignore, or forget, and that, in proportion as we do so, imperil not merely ourselves but all animate forms, and the planet which is Earth as well.

Chapter 9, "Human Speech Perception and an Evolutionary Semantics," first lays out the motor theory of speech perception as it has been vindicated over the past forty years by the research studies of psychologist Alvin M. Liberman and various associates. The theory (1985:25) states that "the object of [speech] perception is motoric," meaning that gestural rather than acoustic signals are the foundation of speech perception. Liberman et al. originally explained their research findings according to behaviorist tenets; they explain them now according to cognitivist ones, claiming that the brain houses "an internal, innately specified vocal-tract synthesizer … that incorporates complete information about the anatomical and physiological characteristics of the vocal tract and also about the articulatory and acoustic consequences of linguistically significant gestures" (26). The chapter presents an extended critique of Liberman's "vocal-tract synthesizer" explanation of his research results and offers in its place an explanation grounded in real-life tactile-kinesthetic experiences, experiences that start with babbling, lip-smacking, cooing, and other mouth movement/sound play, and end with a child's mastery of the articulatory gestures of her/his native tongue. In effect, in place of a brain is a living subject. In support of the latter explanation, the chapter goes on to examine a number of relevant topics. It first considers comsigns — primatologist Stuart Altmann's term for communications that are shared by all members of a group or species — and tactical deception — the ability of humans and other primates to deceive by moving in perfectly normal ways for quite other-than-normal ends. Both comsigns and tactical deception raise the question of how a common repertoire of gestures, sounds, visual displays — indeed any form of communication, including verbal language — could possibly have evolved short of living subjects; that is, they raise the question of how interanimate meanings could possibly come to be established short of actual interactions of actual living creatures. Put in the perspective of an evolutionary semantics, the chapter shows that interanimate meanings evolve on the basis of common tactile-kinesthetic bodies, and, on the basis of common tactile-kinesthetic bodies, on the basis of analogical apperception, i.e. apperceiving the movement of other bodies on the basis of one's own tactile-kinesthetic experiences of one's own body. The chapter shows, in effect, that living creatures are sources of meaning and are primed for meaning; meaning is a dimension of both primal animation and primal bodily sensibilities. Interanimate meanings, and in turn species-specific semantics, are from this vantage

point grounded in a fundamental and altogether natural propensity toward meaning. Psychologist Jerome Bruner's extensive studies of language development in infants and primatologists' studies of language learning in bonobo chimpanzees indirectly but pointedly validate the propensity.

The chapter that follows — "Why a Mind Is Not a Brain and a Brain Is Not a Body" — examines at length the liabilities of a conspicuously robust but conceptually debilitating theoretical bias in many present-day cognitivist explanations of minds and bodies, a bias that inordinately favors brains to the exclusion of the animated realities of living creatures. The examined liabilities include an undue elevation of language, a radical (eliminative) materialism, and a Meccanized neurology. Each liability is shown to be not only pernicious to an understanding of living creatures — animate forms — but to be internally incoherent, as when language is deemed the beginning of consciousness but the beginning of language, by such a claim, cannot itself be accounted for; or as when one credo is deemed the correct one over all others when in putative truth all credos are neurological equals of each other — all credos being merely neurological events. An extended examination of the conceptual difficulties inherent in brain-in-vat scenarios illustrates in fine detail why a brain can stand neither in place of a living body nor in place of a mind, and why such philosophically-spawned thought experiments are impotent to shed light on the mind/body problem. In this context, some well-known mid-twentieth-century neuroscientific experimental and theoretical literature is cited and discussed, in particular, the work of psychologist Roger Sperry and neuroanatomist Wilder Penfield. Careful study of their research shows that so-called "efferent stimulation" of a vatted brain is a kinetically meaningless locution, both literally were a brain-in-a-vat to exist, and theoretically on behalf of the thought experiment. Close examination of this and other equally vexing problems highlights fundamental difficulties with neurological Mecca that center on the kinetic spontaneity of living subjects. A resolution of the difficulties leads to the possibility of a linkage between philosopher Thomas Nagel's (1979) famous inquiry "What Is It Like To Be a Bat?" and the theoretical formulations of both Sperry and biologist Jakob von Uexküll, in particular, Sperry's conclusion that the brain is an organ of and for movement and von Uexküll's explication (1957: 46–50) of the perceived "functional tone" of an object, a tone created and established through a creature's possible movement in relation to the object, thus its sense of the object in the near Husserlian sense of an object *as meant* (Husserl 1983). When recent twentieth-century scientific literature on the motor system is closely consulted and analyzed, the central significance of self-movement to cognition comes ever more clearly into view. In this context, the chapter presents a range of highly significant findings: that neurological mappings of the motor cortex are as unpredictable as human behavior; that kinetic possibilities are the domain of an intentional subject; that such a subject is not merely goal-directed but meaning-directed; and so on. The chapter concludes with an admonition about

the hazards of substituting brain technology for phylogenetic and ontogenetic histories, an admonition tied to the sobriety of adhering to a version of psychologist Lloyd Morgan's famous canon (1930), which would decree that whatever can be explained in terms of animate form should not be explained in terms of mechanical form, not only because animate forms are more commonly distributed than mechanical forms but because only such forms can explain what it is to be a mind and what it is to be a body.

Chapter 11, "What Is It Like To Be a Brain?", is a philosophical inversion of Nagel's (1979) article "What Is It Like To Be a Bat?". The chapter begins by paraphrasing sections in the opening paragraphs of his article in materially reductive cognitivist terms. In drawing out the reverse affinities, the chapter attempts to describe what it is like to be a brain *for the brain itself* — as Nagel would insist it must. It considers first that a brain is commonly described as the site of neurological, electrical, and metabolic happenings, that activity is taken to be a fundamental fact of brain matter, and that neither materialist nor functionalist accounts of brains capture or explain the fundamentally active nature of a brain. The chapter takes up the challenge of this deficiency, inquiring into the active nature of brain matter by focusing on detailed descriptions of neural firing; that is, it examines at length and in exacting terms what it means to say that *an action potential shoots down an axon*. It attempts to specify what it is like *for the neuron itself*, the Nagelian point being that, if we cannot say what it is like for a neuron to fire, i.e. for an action potential to shoot down an axon, then we have not the most elementary notion of what it is like to be a brain. In turn, and in Nagel's terms, we have a belief in the existence of kinetic facts — action potentials shooting down axons — "whose exact nature we cannot possibly conceive" (Nagel 1979: 170). The challenge of reckoning with, and of explaining the elemental animation of brain matter prompts consideration of materialist philosopher David Lewis's (1991) proposed distinction between two forms of knowing: 'to know what it is like' is to possess certain abilities; to know *tout court* is to possess information. By hewing to an informational construal of knowledge, Lewis attempts to save materialist and functionalist doctrine from the taint of qualia (from "phenomenal" or "subjective" experience; 1991: 234). The chapter shows, however, that Lewis's distinction can itself be saved only by de-animating matter, in other words, by conceiving the brain not as the site of kinetic happenings, but as — in Lewis's terms (1991: 234) — "a smart data bank," an information repository. In effect, in order to answer the question, what is it like for a neuron to fire?, the chapter asks whether animism is necessary to materialists' accounts of matter. The question is duly examined. Answers to the general charge of animism show that materialists are committed in spite of themselves — as Nagel inversely notes with respect to bats — to beliefs in the existence of facts beyond their conceptual reach. The last section of the chapter shows how, when we cease pledging allegiance to functionalist and materialist doctrines, and by extension, to *the brain*, we find that the very criticisms materialists

lodge against non-reductionists — they are "mysterians" (Flanagan 1991: 312–14) or "phenomenologists"(Dennett 1991: 55–65) — can be readily lodged against materialists themselves. It concludes by presenting just such criticisms, specifying how materialists are "mysterians" in failing to explain the most basic feature of brain matter — its elemental kinetic activity — and how they are "phenomenologists" in failing to be objective in their methodological procedures and in their conceptions and evaluations of brain activity.

The final chapter, "Thinking in Movement," opens with a descriptive account of a paradigmatic instance of the phenomenon: thinking in movement in improvisational dance. It proceeds to a consideration of two assumptions, each of which might impair an unbiased reading of the descriptive account: the Cartesian assumption that minds think and bodies "do," and the widespread assumption that there is no thinking outside of language — or outside of some kind of symbolic system. Analysis of the paradigmatic experience of thinking in movement in improvisational dance shows that thinking and moving are not separate happenings but are aspects of a *kinetic bodily logos* attuned to an evolving dynamic situation. It show further that thinking in movement involves no symbolic counters but is tied to an on-going qualitatively experienced dynamic in which movement possibilities arise and dissolve. The analysis accords in fundamental ways with psychological studies showing that an infant's initial concepts are tied to dynamic events, to kinetic happenings, that prior to its passage into a world of language, an infant's initial concepts are tied to experiences of both its own movement and movement in its surrounding world. Drawing initially on child psychologist Lois Bloom's (1993) extensive studies of the transition from infancy to language — both because movement is not at the forefront of her research concerns (cognition and affect are) and because movement is nonetheless clearly central in her account of language development — the chapter shows how studies of infants indirectly affirm that infants think in movement. It points out that psychologist Jerome Bruner's lifelong research and writings on infant/child development indirectly affirm the same thesis, his essential finding being that the principal interest of infants, an interest that carries over into language, centers on agentivity and action (1990). It shows that infant psychiatrist/psychologist Daniel Stern similarly affirms the same thesis indirectly, specifically with respect to nonverbal behaviors that never become linguistically encoded but that have variable affective tones and that articulate intercorporeal intentions (1981, 1985). Through such citings of the literature, the chapter makes abundantly clear that rather than speak of the period before language as the *pre-linguistic*, we should speak of the advent of language as the *post-kinetic*. Following an examination of the literature on infant development supporting the thesis that ontogenetically, thinking in movement is our original mode of thinking, the chapter puts the phenomenon of thinking in movement in phylogenetic perspective. It shows that instances of thinking in movement abound in the literature on nonhuman animal life, as when ethologists

describe how killdeer move in particular ways to protect their young from particular harms (Griffin 1984; Ristau 1996), when field biologists describe spatially and temporally complex food-supplying behaviors of sand wasps (Tinbergen 1968), and when laboratory biologists describe escape behaviors of creatures such as paramecium and fan worms (Scott 1963; Wells 1968). In each instance, a natural kinetic intelligence, a kinetic bodily logos, is at work. As the chapter demonstrates in some detail, this intelligence cannot be written off as mere instinct, i.e. as robotic and unadulterated biological givens. Neither can it be written off as merely an adaptive mechanism. The intelligence or logos is an elemental biological character of life, a dimension of animate form that, however written between the lines, is confirmed in the writings of zoologists, primatologists, and ethologists. It bears emphasizing that the implicit confirmation is not that animals think in terms of *behavior*, but that they think in terms of kinetically dynamic patterns, in terms of *movement.* Indeed, from this vantage point, behaviors *evolve* only because behaviors are essentially complex dynamic patternings of movement, and movement being the mother tongue of all animate forms, thinking in movement is both a primary fact and a perpetual possibility of animate life.

Notes

1. Although Bell goes on to say (1990:215) that "these changes … never emerged clearly in Husserl's thought," there is much to say that they did, at the very least to the extent that Husserl recognized them as integral aspects of experience. A clarification is also in order. By the characterization "phenomenological-kinetic method" (Husserl 1980:1, 117), Husserl was not endorsing a peripatetic methodology. His concern was to distinguish ontology from phenomenology, a fixed notion of objects as against an account of their constitution, or in other words, as against genetic understandings of their epistemological origins in experience. The phenomenological method is thus "kinetic" in that it progressively excavates layers of meanings, as those meanings have been laid down over time in experience. But it should be pointed out too that the phenomenological method also elucidates the absolutely pivotal role of "the kinestheses" in the constitution of objects, as Chapter 4 will show, and in this sense might be qualified as "kinetic."

2. The full passage reads "We are still unable to form a conception of *how* consciousness arises in matter."

3. The phrase "I can" comes originally from Edmund Husserl's insightful and seminal descriptive analyses of experience. See especially Husserl 1980:106–12; 1989:13–15, 159–60, 228–31, 266–282, 340–43. See also Husserl 1970a: 106–108, 161, 217, 331–32; 1973:97. The import of this fundamental and eminently significant "faculty," as Husserl termed it, will be apparent many times over, implicitly as well as explicitly, throughout this book.

4. I borrow the phrase from Husserl (and singularize it), who used it not in describing movement but in describing phenomenology. See Husserl 1980:69.

SECTION I

Foundations

CHAPTER 1

Neandertals

> Experience shows the problem of the mind cannot be solved by attacking the citadel itself. — the mind is function of body. — we must bring some *stable* foundation to argue from. Charles Darwin ([1836–44] 1987: 564)
>
> We must begin our examination with movement.
>
> Aristotle (*De Anima* 405b: 33)

1. Introduction

I envisage this opening chapter as a contribution to what zooarchaeologist Mary Stiner envisions when she says, "Some new ways of working with archaeological records are needed, as well as new perspectives on the data they yield" (Stiner 1994: 3). With respect to her own work, she says that "The continuity-replacement dialectic [concerning Neandertals and anatomically modern humans] has been useful, but I think that there are other productive ways of visualizing change in human foraging practices, alternatives that merit exploration in light of what we now know from the faunal perspective" (Stiner 1994: 387). Similarly, there are other productive ways of visualizing change in hominid morphology, ways which result in kinetic rather than static understandings of differences between Neandertals and anatomically modern humans and which merit conceptual exploration. Ecological paleoanthropologist Steven Kuhn's critical observation that "Too often, research is framed in terms of 'inherited' questions" (Kuhn 1995: 5) is exactingly topical to this endeavor.

There is a way in which the present controversy over the status of Neandertals vis à vis *Homo sapiens sapiens* — modern humans — epitomizes the great Western mind/body dichotomy. When it comes to assessing our capacity for thinking, the terms of the inquiry and subsequent discussion quickly gravitate to language — or to kindred forms of what is designated "symbolic behavior."[1] Bodies are hardly at the forefront of thought about thought; neither for that matter is movement. Not only this but language is not infrequently conceived a solely human phenomenon with no significant historical antecedents, that is, a phenomenon with no substantive evolutionary linkages whatsoever, whether on the basis of deficient anatomies (Lieberman 1983, 1972; Laitman 1983), of a deficiency in linguistic design features (Hockett 1960), of a deficiency in rational behavior (Bennett 1971), of a deficiency in communicative repertoires (Wilson 1972), or of

a deficiency with respect to a Center of Narrative Gravity (Dennett 1991). The result is that a certain preeminence is protected. While there is no question but that human language and other so designated forms of "symbolic behavior" such as the creation of art objects are *culturally* unprecedented phenomena and ones that bring with them an untold richness and unending capacity for knowledge, there is every reason to question that such forms arose *de novo*, that they have *no* evolutionary ties, thus that language, for example, sprang full-blown from the mouths of waiting hominids, and that present-day humans are on that account thoroughly unique products of evolution. The concern here is less directly with showing how that preeminence is unfounded and how sustaining it is myopically self-serving (see Sheets-Johnstone 1992b, 1996a, 1996b)[2] than it is with showing how an immediate and thoughtless turn toward language and other so designated "symbolic behaviors" is precipitous: it deflects us from a recognition and understanding of a phylogenetically and ontogenetically more basic phenomenon, the phenomenon of movement. Indeed, those intricate and subtle everyday gestures whose once invented and now learned articulations constitute human speech are consistently taken for granted or ignored.[3]

An airing of the Neandertal controversy appeared in *The New York Review of Books* in an article by the noted zoologist-geologist Stephen Jay Gould. Gould nicely summarizes the controversy, but in marking out his stand on the issue, he straightaway exemplifies the seminally engrained and epistemologically debilitating Western dichotomy that precludes taking movement seriously and giving the body its due. Gould critically considers two 1993 books on Neandertals, each written by "leading experts on Neandertals and on the rise of modern humans" (Gould 1994: 26). The books, according to Gould, "take opposite sides of [the] controversy" (Gould 1994: 26). Christopher Stringer and Clive Gamble, in *In Search of the Neanderthals: Solving the Puzzle of Human Origins*, favor the "Noah's Ark" view, that modern humans arose out of Africa from a small population which migrated first to Europe and then to all parts of the world. Erik Trinkaus and Pat Shipman, in *The Neandertals: Changing the Image of Mankind*, "[take] no 'official' position," Gould says, "but clearly [lean] toward the multi-regionalist approach" (Gould 1994: 26), namely, toward the view that modern humans evolved from populations already spread on three continents (Africa, Europe, and Asia) in the form of *Homo erectus*.[4] Neandertals, on the first view, are not directly related to present-day humans; on the second view, they are our European ancestors. Through a critical examination of Gould's review, we will see first both where and how multiple strands of the engrained Western mind/body dichotomy consistently inform — and skew — research and perspectives on Neandertals. Given this foundation, we will then turn to a detailed critical review of Stringer and Gamble's account of Neandertals. Though plainly severe in its assessment, the purpose of the review is constructive. Its aim is to demonstrate the need for deeper examinations and analyses of "symbolic behavior," and correlatively, to demonstrate the need to expand typical

ways of construing "physical" anthropology. The succeeding three sections will carry through the constructive purpose by showing first how symbolic behavior is fundamentally tied to corporeal matters of fact, as evidenced in both the phenomenon of corporeal representation and analogical thinking, and in turn, how understandings of animate form are crucial to comparative studies in paleoanthropology, thus crucial to an understanding of Neandertals.

2. "Remarkable mental adaptations"

To begin with, a larger question in Gould's article, a question of *theory*, dominates the more immediate question of Neandertals themselves and what they were like. In other words, the question of moment for Gould is not a factual one. As he explains, he does not have "the requisite professional expertise to declare a preference on factual grounds between the two views" (Gould 1994: 27–28). His decision in favor of Stringer and Gamble over Trinkaus and Shipman is on the grounds that the Noah's Ark theory is the orthodox evolutionary one. That orthodox theory, Gould says, is defined by its focal emphasis on contingency, chance, unrepeatability, and other such features. Gould has himself enfolded that theory within his theory of punctuated equilibrium — the idea that evolution proceeds not through phyletic gradualism but by relatively sudden change interrupting long periods of stasis. The idea of punctuated equilibrium supports the notion that modern humans replaced Neandertals rather than merged with them genetically over time; it thus supports the Noah's Ark theory. Gould terms the Noah's Ark theory an "entity" theory as opposed to a "tendency" theory, the latter kind of theory defining the kind of view he attributes to Trinkaus and Shipman (Gould 1994: 27). He spells out the distinction between the two theories in terms of a difference in the way humans conceive themselves: as creatures evolving everywhere "toward the traditional *summum bonum* of bigger brains … because big brains are so good to have, and natural selection must have favored them in all environments of our diverse geographical spread"; or as creatures whose evolution was a thoroughly fortuitous happening that has no inevitability whatsoever about it (Gould 1994: 27).[5] While the global spread of the "entity" that evolved as a small group of hominids "in one small place during one restricted interval in time" might be the result of "remarkable mental adaptations[,]" Gould declares, it was "not an inevitable development arising on a planetary scale" (Gould 1994: 27). Clearly, what Gould is at pains to contrast is a view of humans as the inevitable (and even proper) culminating point of eons of evolution with a view of humans as thoroughly contingent and unrepeatable creatures like all others in evolutionary history. The major problem in urging the latter view in this context is that Gould is uncritically seduced both by Stringer and Gamble's characterizations of Neandertals and by their specifications as to what exactly constituted the difference

between Neandertals and *Homo sapiens sapiens*. The minor problem is that he casts Trinkaus and Shipman's account into an ill-fitting mould, a problem which we will not examine here.

As his earlier allusion to "remarkable mental adaptations" might indicate, Gould assumes that what distinguishes Neandertals from modern humans lies exclusively in the realm of the mental. Thus, at least to some extent we are forewarned when, in turning to sketch out what Noah's Ark theory might actually mean in terms of a valid understanding of Neandertals and their differences from us, he asks, "Could we possibly define the *mental essence* of these differences, thus helping us to understand the basis of our *uniqueness*?"(Gould 1994: 28, italics added). In the simplest and most basic of terms, it is as if minds have categorically nothing to do with bodies. What makes us unique is our mental marrow, pure and unadulterated. Moreover it is as if "the mental" never evolved for, precisely as suggested earlier with respect to the ready gravitation toward language and kindred "symbolic behaviors," when it comes to considering *human* evolution, "remarkable mental adaptations" leave other creatures behind. We will examine this aspect of the issue more fully below. What is of interest to note here is how strongly Darwin affirmed continuities in the evolution of what he called "mental powers" — e.g. attention, memory, reasoning, and so on — and how clearly he did not separate off these powers from living bodies (Darwin [1871] 1981). What is furthermore of interest is how computational cognitivist concerns and practices impel researchers not toward the further study of these powers as they are manifest in such observed and observable behavioral similarities and differences as Darwin noted, but toward specifying and analyzing "rule-governed behaviors," e.g. the rules of syntax, the rules of word use, the rules of object use (e.g. "if B is a container, A belongs inside it" [Clark 1979: 159; Clark 1973]), and so on. Indeed, Gould speaks of "general learning rules" that characterize modern humans and of the possibility of "infer[ring] these rules of our uniqueness from differences in the overall patterns of Neandertal and modern life" (Gould 1994: 28). With such rules, he says, "we might gain great insight into the biological source of our humanity" (Gould 1994: 28). In short, on Gould's account, the rules by which we operate constitute our mental marrow and define us as creatures. Anchoring his thoughts centrally in this fundamental cognitivist notion of rules, Gould then proceeds to pinpoint briefly Stringer and Gamble's three themes that, he says, "strike me as being on the right level of abstraction, in contrast to the overspecificity of most discussions about adaptation" (Gould 1994: 28). What Gould wants to avoid through abstraction is an adaptational account on the order of sociobiological analyses that view each and every body part and behavior as "adaptive" in some way. But clearly, in opting for "abstraction," he hazards another liability. To see this, we shall critically examine Stringer and Gamble's three themes directly and in detail.

3. "Symbolic behavior"

In their final chapter, which poses the question "Close Kin or Distant Relatives?" as its title, Stringer and Gamble set forth what they designate a behavioral answer to the question of the relationship of "the Ancients" to "the Moderns," that is, the relationship of Neandertals to modern humans. In particular, they say that the "fate" of the Neandertals is a function of "the enormous changes in behaviour that took place in Europe 40,000 years ago — changes which we believe convincingly *prove* that replacement, rather than continuity, is the best explanation for current evidence" (Stringer & Gamble 1993: 199, italics added). Quite apart from *proving* anything outside of mathematics, the idea that one can prove that a particular historical event took place over a period of time thirty to sixty-or-more thousands of years ago is far-fetched. Precisely where there are no practices to observe first-hand much less any individuals to interview, one can hardly offer anything but an interpretation of the data. If one were to respond that Stringer and Gamble merely over-extended themselves verbally and conceptually muddied the waters inadvertently — that what they meant to say, for example, was that they believe replacement a superior explanation on the basis of current evidence of changes documented in the evolutionary record — one would find oneself hard-pressed to maintain that sympathetic understanding in view of the conceptual muddles in their presentation of, and reasoning about, the "enormous changes" that carry the weight of their explanation. Conceptual over-extension is distressingly evident throughout their discussions.

The three major enormous behavioral changes are linked to the establishment of (1) campsites, (2) settlements, and (3) new habitats. Each of these domains is regarded a social phenomenon and is designated a form of "symbolic behavior." We should note that Stringer and Gamble also discuss tools, "art and symbolism," and burials in their summary yet highly detailed review of the "enormous changes" that took place 40,000 years ago; but as Gould notes, and as Stringer and Gamble themselves document in their remarks in various chapters (Stringer & Gamble 1993: e.g. Chapter 7, p. 146; Chapter 9, pp. 197, 219), the emphasis is on the afore-mentioned three changes. Their emphasis notwithstanding, because the difficulty is basically a conceptual one, the appropriate point of departure for a critical assessment of their account is not with the momentous changes themselves — whichever ones one might single out — but with the concept of "symbolic behavior" or "symbolism" by which they characterize all of the changes.

The introduction of the concept appears first in a chapter titled "The Archaeology of the Ancients" where various references are made to "[the] important debate about the birth of symbolic behaviour" (Stringer & Gamble 1993: 161), but the fuller elaboration occurs in the last chapter "Close Kin or Distant Relatives?" under the section heading "Art and symbolism," where Stringer and Gamble begin by recalling their previous argument that "earlier items [i.e. "art and ornament" *prior* to the

Moderns] are unconvincing as evidence for symbolic behaviour either because they lack a context where symbolism might be required (such as a burial) or because they are unique examples, unrelated to any wider system that used the repetition of design and shape as symbols for action" (Stringer & Gamble 1993: 203). Following this general claim, they state their disagreement with those evolutionists who have argued that symbolic behavior developed slowly; they thus voice their disagreement with those who espouse the idea of *cultural* as well as phyletic gradualism. "We disagree with their insistence," say Stringer and Gamble, "that symbolic behaviour is something that can be turned up and down like a light on a dimmer switch. On the contrary, arranging behaviour according to symbolic codes is an all or nothing situation. The onset of symbolic behaviour can be compared to the flick of a switch" (Stringer & Gamble 1993: 203; cf. Eldredge & Gould 1972 on punctuated equilibrium theory). Spelling out this "arranged-according-to-symbolic-codes" conception of "symbolic behavior," they say that "Symbolism involves making mental substitutions and appreciating associations between people, objects and contexts; once established, symbolism cannot simply be dropped or forgotten." They assert furthermore that "symbolic behaviour requires memory and periodic renewal through repeated ritual" and that "[t]he objects used in such rituals tend to be standardized, leading to the creation of a shared art form." With respect to the objects of "ritual art and ornament" that began appearing in the archaeological record 40,000 years ago, they say that "the symbolic behaviour associated with these objects was … clearly in practice" (Stringer & Gamble 1993: 203).

On the basis of these various claims and statements, one might conclude that what Stringer and Gamble are trying to say is that symbolic behavior is generated by symbolic codes that specify certain mental substitutions. But the question is not only, what exactly does this relational formulation mean? — that is, how does the reputed symbolic process translate concretely into actual life activities? — but how did such behavior — or mental substitutions — originate? Especially if symbolic behavior is "an all or nothing situation," it is difficult to imagine how it could possibly have originated. Indeed, we seem perilously close to affirming the idea that language arose one day full-blown from the mouths of waiting hominids and art one day full-blown from their hands. We seem equally perilously close to affirming the idea not of a "creative explosion," as Stringer and Gamble (borrowing a phrase from John Pfeiffer) characterize "the onset of symbolic behaviour"(Stringer & Gamble 1993: 203), but of an *unconscious* explosion in the sense that forces completely outside of what people ordinarily would call "conscious control" flick the switch in each case. Indeed, if "the huge changes in behaviour that took place in the early Upper Palaeolithic resemble the flick of a switch and *not* the slow upwards movement of a symbolic dimmer," then these hominids must have found themselves doing something entirely new and momentous on the spot, and this could only have happened if unbeknownst to them, symbolic

codes — mental substitutions — suddenly arose from an unconscious mental domain and just as suddenly instantiated in them a momentous new behavior. Not only this, but to be effective, the sudden onset would have had to have occurred in *orchestrated concert*. Symbolic codes could only operate *socially* if they were set off in unison.

Stringer and Gamble's discussions and analyses of artifacts readily exemplify the conceptual problem. In a section titled "Campsites as symbols," they contrast "symbolic behaviour" with mere "survival behaviour" (Stringer & Gamble 1993: 204). This distinction notwithstanding — we shall consider it in further detail below — the idea of campsites as symbols and of the architecture of campsites as "symbolic behaviour" is puzzling in the extreme. At the beginning of the section, Stringer and Gamble write that "Having investigated the appearance of symbolic behaviour by examining the changes in art and technology, we will now take a look at the evidence from campsites." They speak of "more formal living spaces" being created at this point in hominid evolution — hearths and huts, for example, and post holes and pits (Stringer & Gamble 1993: 204). The conceptual muddle they generate in the process of describing these new spaces can be put quite simply: what is a campsite a symbol of? An answer to the question is nowhere to be found in the text. Yet clearly, we should have an answer. Indeed, we may ask what a campsite is a symbol of in the same way that we may ask what technology — the crafting of a stone tool — is a symbol of or how its crafting constitutes "symbolic behavior." The latter question may perhaps exemplify the quandary in a more succinct manner because stone tool-making is a more familiar and spatially discrete constructive activity. Recall, for example, that Stringer and Gamble, implicitly contrasting Moderns with Ancients, speak of "repetition of design and shape as symbols for action" (albeit in the context not of tools but of the question, "What is the significance of the appearance of art and ornament?") (Stringer & Gamble 1993: 203). In a patient effort to understand conceptually exactly what they are describing in specifying such repetition, and in thinking back some forty-odd pages to an earlier mention of "repetition" explicitly in reference to hand-axes and other tools of the Ancients, a careful reader might end up piecing together the above suggested formula: symbolic behavior is generated by symbolic codes specified by certain mental substitutions. The formula suggests itself because in their earlier use of the term "repetition," Stringer and Gamble refer to "limited, repetitious forms" that, they declare, were *not* "determined by symbolic codes" (Stringer & Gamble 1993: 161). Thus one assumes that in the crafting of a tool, when the repetition of a particular form is *not* guided by mental substitutions, "symbols of action" are not produced. Validation of the formula by which we should understand what Stringer and Gamble are saying, however, does not ease the strain. The reader remains perplexed. This is because, even with the formula, basic questions go unanswered. Just as Stringer and Gamble nowhere explain what a campsite is a symbol of, they nowhere explain where symbolic codes come from, how certain designs and shapes and not others come to be informed by symbolic codes, or just

what a symbolic code might be in the first place. In particular, they nowhere explain how repeating certain designs and shapes (and not others) in the actual crafting of a tool constitutes symbolic behavior and how that symbolic behavior makes particular tool designs and shapes "symbols of action." In some manner or other, mental substitutions are "flicked on," a behavior thereby becomes symbolic, and the symbolic nature of the behavior is somehow transferred such that a completed artifact — a tool — stands for, or "mentally substitutes for" something else, i.e. "action."

Clearly, in spite of efforts to comprehend, a distressing conceptual jumble and consequent muddle of meaning remain. Words or phrases such as "symbolism," "symbolic behavior," and "symbolic codes" have a patently compelling aura about them — they are honorific, they straightaway signify intellectual acumen — and on first glance, we may think we understand what is being said. When we carefully examine what is being said, however, clear, reasonable meaning is nowhere to be found, either in the terms or phrases separately or as a unit. When put to the test — *cashed in for real currency* — the words fail to deliver. This is because campsites themselves are not symbols, nor are items such as tools that are connected with them, nor are "patterns of settlement" nor are "new habitats." These constructions achieve symbolic status only on the basis of *being currently read as symbols*; that is, they are symbols only from the interpretive perspective of Stringer and Gamble — and others — who read them as *symbols of* intelligence. Pits used for the storage of fuel at a campsite, for example, or stacked mammoth bones that form a hut (Stringer & Gamble 1993: 204) are not symbolic of anything. They are what they are; they refer to something beyond themselves only in the sense of referring to what Stringer and Gamble (and others) find "intelligent." There is no doubt but that by such a standard, symbols are arbitrarily defined; like proverbial beauty, they exist only in the eye of the beholder. Pits and huts may indisputably be regarded ingenious constructions, extraordinarily clever utilizations of the environment, and so on, but such positive regard does not make them symbols nor can it confer symbolic status upon the behavior of their makers. When Stringer and Gamble write that "architecture now embodies cultural, symbolic behaviour and not purely expedient survival behaviour" (1993: 204) they are confusing their own judgments with that which they are judging. Their attributions are conceptually muddled because they are projections of their evaluations and not descriptive of the things themselves.

When we realize this fact, we begin to get a sense of the underlying, fundamental conceptual problem: the mental has been separated off from the physical to effect a rigorous opposition, then is later rejoined to glorifying effect. Although the ostensible concern is with behavior — the fabrication of hearths (thus campsites), the establishment of social networks (thus settlements), the expansion into new habitats (thus colonization) — behavior is conceived as merely a physical happening — a mere survival event. To be something more than a mere survival event, behavior must be regulated by behind the scene mental codes that have somehow arisen and become operative. *Then*, behavior becomes symbolic. But there is nothing actually

grounding the epistemological connection; there is only the contiguous placement of two words: symbolic behavior. Moreover, a further difficulty is evident when one tries to bridge the gap between whatever has been established or created — campsite, settlement, new habitat (or tool) — and the symbolic code by which it has purportedly been made, thus a difficulty in identifying the product as a symbol by way of its maker's behavior. The identification might at first seem less difficult in the realm of art, for this kind of product is already a culturally-accepted form of symbol-making activity, at least for us Westerners. But even here, we would hardly attribute "symbolic behavior" to the artist forming the work. Indeed, if we apply the formula to the *making* of a work of art, we find nonsense. To say that the artist fashioning the art object — be it a painting, a dance, or a symphony — is engaging in symbolic behavior is to say that her/his actual behavior at any particular moment in the process of creation — indeed, during the entire process — stands for something else. Thus the actual application of paint, or the actual execution of a series of leaps, or the actual sounding of tones is in each case symbolic, i.e. an act of "mental substitution." The idea that an artist is behaving in this way when she/he is "making art" is clearly absurd. The situation becomes even more absurd when it comes to applying the formula to explain exactly how an art work is symbolic. In particular, how do symbolic codes that exist somewhere in "mental space" come to leave their symbolic mark on objects in the world? Even if the symbolic codes are said to be mediated by "symbolic behavior," it is totally unclear how the thing created by the symbolic behavior comes to have the purported standing-for character of the behavior.

In sum, the terms "symbol" and "symbolic behavior" are in need of fine, painstaking clarification and elucidation. As it stands, they cover a multitude of confusions, the price of playing conceptually loose with language and of attempting to join together lexically not only what has been conceptually rendered asunder but what is being actively maintained asunder by opposing categories of behavior — such as "survival" and "symbolic" — that further harden the familiar three-and-a-half-century-old Western division of "the physical" and "the mental." With such oppositions, the fundamental breach between physical and mental can never be reasonably joined — except by lexical concatenation. In no other way can a mental code suddenly become active, erupt into and substantively inform a behavior, and that behavior, with its substantively informing code, result in and substantively inform a product.

The conceptual muddle thickens when Stringer and Gamble turn to concrete comparisons between "Ancients and Moderns." As we have seen, survival behavior, a physical functioning, aligns itself with Neandertals; symbolic behavior, a mental functioning, with *Homo sapiens sapiens*. The underlying categorical separation remains decisively evident in subsequent epistemic attributions. Not only do Stringer and Gamble cast denigrating doubt on Neandertal burial practices — "whether it was a burial in the modern sense or more akin to rubbish disposal is the point at issue" (1993: 159) — they claim that Neandertals "had the capacity for emulation, for change,

but not for symbolism." They go on immediately to say, "We explain this as follows: the Neanderthals were under selective pressure, both biological and cultural, to survive" (1993: 207). Their explanation leaves something to be desired, in part because selective pressures to survive are pan-animate: all creatures, modern human lineages included, have been and are "under selective pressure to survive." What Stringer and Gamble perhaps mean to say is that they believe Neandertals were under unusual selective pressures. What these unusual pressures were, however, is not specified except vaguely in the form of "the Moderns": "the Moderns changed the forces of selection on Neanderthal behaviour" (1993: 207). In this context, Stringer and Gamble suggest that since Neandertals were not tied to "millennia-long traditions" and so made "decisions about making tools and building camps … according to expediency and efficiency," they functioned in a thoroughly rote way. Moreover they assert that "the archaeological evidence clearly indicates that the Neanderthals imitated certain aspects of modern behaviour" (1993: 207). The assertion constitutes a bold if not intemperate claim. "Clear indications" are indeed a lot to claim for archaeological evidence, especially when it comes to motivational attributions, i.e. imitation. But Stringer and Gamble press the claim even further in a final judgment. They write that "[W]hile they [Neandertals] could emulate they could not fully understand" (1993: 207).

Now surely this judgment constitutes a form of mind-reading, and especially in the absence of actually observed behavior, mind-reading is not ordinarily countenanced as an empirical tool. To offer an assessment of what another person — let alone another creature, especially one whom one has never seen and whom one discounts as a direct lineal ancestor of humans — understands or does not understand is scientifically risky. Indeed, in primatology, the idea that chimpanzees have a theory of mind ran the gauntlet of critical peer review (Premack & Woodruff 1978). It is surprising, then, that Stringer and Gamble not only exceed the bounds of objectivity in the form of standard scientific practice, but to credit "clear indications" and their ensuing mental attribution, they attempt to solidify their judgment by sharing a suspicion with the reader: "We suspect," they write, "that the structures at Molodova and Arcy-sur-Cure more resembled 'nests' than the symbolic 'homes' of the Moderns at Kostenki or Dolni Vestonice" (1993: 207). With their allusion to nightly nest-making practices of chimpanzees, their downplaying of "the mental" in Neandertals is unmistakable. Their innuendo points to a lapsed, inept, utterly subhuman mind, one incapable of symbolism, and in effect, to what is for them an inarguably deficient hominid.

4. Deepened understandings of the symbolic

In Stringer and Gamble's view, "the fundamental difference between the Ancients and Moderns is social" (1993: 213) — hence the prominence of "associations between

people, objects and contexts" in their definition of symbolism and in what they designate as symbols and as critically significant behavioral changes. This preeminently social understanding of symbolism is not in the least peculiar. Anthropologists and philosophers generally concur that a symbol is a social phenomenon. Cultural anthropologist Raymond Firth, for example, writes that an anthropological approach to symbolism "links the occurrence and interpretations of symbolism to social structures and social events in specific conditions" (Firth 1973:25). Philosopher Susanne Langer, in her earliest work on symbols, differentiates sign and symbol, remarking that "The passage from the sign-function of a word to its symbolic function is … a result of social organization" (Langer 1948:38). There is, however, a further fundamental aspect of a symbol that both Firth and Langer recognize, and that is its representational power. Firth in fact declares the essence of symbolism to lie "in the recognition of one thing as standing for (re-presenting) another" (Firth 1973:15). Symbols, Langer writes, "let us develop a characteristic attitude toward objects *in absentia*, which is called 'thinking of' or 'referring to' what is not here" (Langer 1948:37). The referential aspect is succinctly specified in the definitional statement that a relation is a symbolizing one "if and only if it is a four-term relation of standing for, where in the eyes of a symbolizer something, the symbol, stands for some other thing, the symbolized, within the context of a particular activity — for example, informing, giving orders, entertaining, or playing" (Johnstone 1984:167). What is requisite, especially given Stringer and Gamble's claim that the advent of symbolism was "an all or nothing situation," is an explanation of how *in an evolutionary sense* the idea of "standing for" could have arisen. In particular, the referential and not just the social dimension of symbolization needs to be evidentially grounded. Otherwise, no matter how social the group of creatures in question, there is no reason why all should treat some one thing as standing for some other thing. The referential dimension, in other words, needs to be shown to be anchored in some form of reality as readily perceptible, that is, as open to immediate awareness, as the social reality of other individuals. To that end, we will consider two interlocking ideas: the idea that *symbolization is a form of analogical thinking*, and the idea that *analogical thinking is foundationally structured in corporeal representation*. As might be apparent, such an understanding of symbolization construes mind and body not as two separate entities that are opposed to one another, or indeed, pitted against one another; it construes them to be all of a piece in the form of a living organism, a "persistent whole" (Haldane 1931:13) in the throes and challenges of everyday creaturely life. In the context of eight paleoanthropological case studies ranging from tool-making to burials to sexual signalling behavior to paleolithic cave art, I documented each of the interlocking ideas in detail; I showed how primatological (including hominid) and zoological studies validate both the ideas and their linkage, and exemplified the linkage in analyses of diverse behaviors. To illustrate in an economic manner the relevance of these ideas to the present need to clarify the nature and evolution of symbolism — and the need as

well to expand typical conceptions of "physical" anthropology — I will summarize and cite passages from this earlier work (Sheets-Johnstone 1990).

Consider first the descriptive report by primatologist C.R. Carpenter whose research of the 1930s in many ways served to establish the field of nonhuman primate social behavior.

> When approaching a male, [the female howler] will form an oval opening with her lips and her protruding tongue will rapidly oscillate in and out and up and down. It is clear to an observer … that the function of this gesture is to invite copulation…. In a real sense the act is symbolic of sexual desire and readiness for copulation in the female and it stimulates appropriate responses in the male.
> (Carpenter 1963: 49–50)

There is no doubt but that Carpenter's description implicitly affirms the tongue to be a readily available spatio-kinetic analogue of the penis and the mouth a readily available spatial analogue of the vagina in the sexual communication of howler monkeys. There is no doubt either that tongue and mouth are sexual analogues in the behavior of other primates as well, as studies of female langurs (Dolhinow 1972) and studies of the tongue-smacking face of some monkey species, especially *Macaca nemestrina* (van Hoof 1969: 52, 58), attest. Genital symbolization is furthermore evident in the sexual tongue-flicking behavior of !Ko Bushmen — present-day hominids (Eibl-Eibesfeldt 1974). Moreover even a ram, in his attempts to interest a ewe in being mounted, flicks his tongue in and out of his mouth as he thrusts his head forward, sidles up to, and nudges the ewe — as any sheep farmer will affirm. In short, there is ample evidence showing that corporeal representation is a biological matrix: in the everyday animal world, there is a fundamental disposition to represent meaning corporeally in the form of tactile-kinetic gestures. By the same token, there is a fundamental disposition to understand meaning corporeally. The quotation from Carpenter documents this fact. Carpenter's untroubled interpretation of the female howler's tongue-flicking behavior shows that Carpenter himself was not puzzled by the behavior nor did he have to analyze the behavior painstakingly to justify to his readers how he arrived at its meaning. On the contrary, his brief verbal description suffices to convey immediately to the reader the same unequivocal meaning the actual behavior embodied for him in the flesh. By the same tactile-kinesthetic/kinetic tokens of experience, the behavior is clear straightaway to the male howler monkey: he too knows "that the function of the gesture is to invite copulation." Were this not so, the gesture would hardly "stimulate appropriate responses in the male."

The fundamental disposition toward corporeal representation in the animate world is a natural disposition toward both iconicity and semanticity; that is, there is an iconic rather than arbitrary relationship between symbol and referent, and a built-in semantic dimension to living bodies that is evident both morphologically

and behaviorally. These natural dispositions toward iconicity and semanticity make decisively clear why — and how — animate bodies are semantic templates, or in other words, why corporeal representation is a fundamental biological matrix. It is a primary mode of communication and symbolization. Where meanings are *represented*, animate bodies represent them corporeally. In their form and behavior animate bodies are a primary source of meaning.

Primary modes of human symbolization substantiate the importance of semanticity and iconicity. These primary modes have been variously elucidated — for example, by Sigmund Freud in his psychology of the unconscious, by Susanne Langer in her aesthetics of art objects, by André Leroi-Gourhan in his archaeological analyses of prehistoric artifacts, and by Mary LeCron Foster in her linguistic analysis of primordial language. In each case, great emphasis is placed on the iconicity and semanticity of the symbols. Indeed, this is why a psychology, aesthetics, archaeology, and linguistics of *symbolizing behavior — behavior that produces symbols but is not itself symbolic* — is possible — why pears and mountains can represent female breasts and umbrellas and tree trunks can represent penes; why works of art can be understood as dynamic forms that are logically congruent to the dynamic form of human feeling; why archaeological artifacts in their design features can be interpreted as representations of female and male genitalia; why the articulatory gestures of primordial language can be shown to be tactile-kinesthetic analogues of their referents (Freud 1938, 1953, Vols. 4, 5; Langer 1948, 1953; Leroi-Gourhan 1971; LeCron Foster 1978). What is important to emphasize — and not only in reference to the above specific domains of corporeal representation in human life, but in reference to corporeal representation generally — is that the behavioral disposition toward iconicity, as toward corporeal representation itself, is not a conscious one — or *necessarily* a conscious one. In the most fundamental sense, bodily symbols are structured not in reflective acts but in pre-reflective corporeal experience; that is, they are the spontaneous product of certain species-specific bodily experiences.[6] What Freud said of the dreamer may thus be true of the symbolizing animal: "The dreamer's knowledge of symbolism is unconscious" (Freud 1963: 148). But while the symbolizing animal may be, like the dreamer, unconscious of its symbolizing behavior as such, *unlike the dreamer*, it is not unconscious of its behavior. It is aware of its own actions in a way gradient to that in which a bird, a song sparrow, for instance, is fully and directly aware of its own song in the process of singing it. Both ethologists and sociobiologists have documented this awareness (Marler 1975, 1976; Dawkins & Krebs 1978). Thus, while perhaps unaware of the symbolism *as such*, an animal — human or nonhuman — may well be aware of the dynamic congruency between one behavior (a symbolic one) and another (its referent), for example, aware of the dynamic congruency between in and out movements of the tongue and in and out movements of the penis.

It should be clear from the above consideration of primary modes of symbolization that corporeal representation is a fundamental mode not only of sexual communication

but of multiple kinds of communication. In the *Tanzsprache*, for example, the dancing honeybee represents direction by her orientation to gravity, distance by the spatiokinetic contours of her dance, and the richness of the food source by the vigorousness of her dance (von Frisch 1964, 1967). Whatever the communicative circumstance, and whichever the creature — whether bees, baboons,[7] bonobos,[8] howler monkeys, or hominids — a form of behavior is evident in which a gesture or sequence of movements points or refers to something beyond itself. Whatever the particular referent, the symbolization is conceptually played out corporeally, along the lines of the body.

Given this evolutionary framework for understanding symbols and symbolizing behavior, two unmistakably major principles emerge: first, *humans (Homo sapiens sapiens) do not have an exclusive corner on symbolization* — they are not privileged evolutionary beings who alone are given to symbolizing behaviors; and second, *the question of the origin of symbolization cannot be reduced to a question of light switches*. In each case, a good deal more is involved. When symbolization is viewed in evolutionary perspective, a broader array of evidence must be examined and a consequently fuller and deeper understanding of symbolization must be offered. Consideration of the origin of hominid tool-making makes both points unequivocally. While a readily self-evident relationship between teeth and stone tools is consistently and intuitively recognized by many researchers (Toth: pers. comm.; see also Toth 1987; Foster 1982; Wolpoff 1980: 92, 168; Mann 1972), an empirically demonstrated *conceptual* association between teeth and tools is not shown. In other words, "the idea of a similarity between teeth and stones is not a new one but neither has it been analyzed to any depth" (Sheets-Johnstone 1990: 26). Thus, to affirm simply that stone tools replaced teeth for processing food gives no indication of the *experiential* and in effect conceptual basis for the replacement. Why not a replacement of teeth by knuckles or feet? To answer that upright posture freed the hands for tool-making does not constitute an explanation of the connection between tools and teeth and thereby explain the origin of tool-making, any more than the affirmation "tool-making freed the teeth for sound-making" constitutes an explanation of the connection between sounds and words and thereby explains the origin of talking. What is needed is a detailed descriptive, i.e. experiential, analysis that shows a conceptual linkage, even a rational connection, between stone tools and teeth. Only in this way can one begin to examine and ultimately understand the *origin* of stone tool-making. With this understanding, it becomes immediately clear that stone tools are not *symbols*; they are stone tools. But they are stone tools that have been crafted on the model of the body, namely, teeth. They are thus *analogues*. Again, as with symbols, such analogues are not necessarily structured in reflective acts but are embedded in pre-reflective corporeal experience. For example, the primary datum of stones and teeth alike is their resistant hardness. They are not squeezable; they do not bend. This quintessential resistant hardness is a felt reality, a tactile-kinesthetic lingual and manual phenomenon. If one knew nothing of stones or teeth but merely saw them, there would be no reason to posit either as hard — or soft. The binary opposites are

clearly tactile qualities. The primary analogy between stones and teeth is thus one of structural correspondence. Just as the analogy is not necessarily a conscious one, neither is it necessarily an articulated one at all; to think analogically is not necessarily to think in words. On the contrary, as the analogy between teeth and stones demonstrates, the similar quintessential hardness of teeth and stones is an *experienced* fact of life. What the example of the origin of stone tool-making thus demonstrates is that analogical thinking is indeed grounded in the tactile-kinesthetic body. What the example thereby also demonstrates is that corporeal concepts — nonlinguistic concepts such as hardness — are in no way inferior to their linguistic relatives. Most importantly too, the example shows that analogical thinking does not necessarily eventuate in the production of symbols. Analogical thinking is a fundamental form of thinking that generates understandings on the basis of bodily experience, and those understandings may or may not eventuate in the production of symbols.

While the example of stone tool-making shows the original crafting of stone tools neither to constitute in itself "symbolic behavior" nor to eventuate in a symbol, it might nevertheless be claimed that at a later time (the Upper Paleolithic), modern human tools were communally conceived as symbols — symbols of power over others, for example, whether hominids or non-hominids. To be viable, however, the claim must address the question of symbolic reference; it must set forth the analogical basis on which tools come to *stand for* power over others rather than being experienced simply as powerful instruments in and of themselves, instruments that can among other things harm or subjugate others. As one anthropologist has in fact pointedly observed, "stone tools that are regarded as symbolic are generally *not* functional as powerful instruments" (Lukacs, pers. comm.). In this regard, then, it is clearly not sufficient to invoke symbolic codes or theoretical acts on the order of "mental substitutions" as operative in the production of tools. Such invocations merely sanction free-wheeling attributions, ones that in some instances seem to border on unbridled arrogance.[9] This is why conceptual muddles develop. This is also why discontinuities can be easily asserted, not only discontinuities between Modern and Neandertal tool-making behaviors and artifacts (and, ironically, by extension, between Modern and earlier hominid tool-making behaviors and artifacts), but discontinuities with respect to "symbolic behavior." The discontinuities — behavioral, artifactual, and symbolic — go hand in hand. With the advent of modern humans, a definitive break occurs, a Rubicon is crossed. On one side are tools, campsites, burial sites, and so on, which are symbols; on the other side are simply tools, 'nests', "rubbish disposals" and the like. The question of how one gets from one side to the other is answered by incantation, as it were: by calling into being "symbolic codes," "learning rules," "mental substitutions," and certain "associations." An empirically grounded answer, on the contrary, lies in the recognition of a faculty already there. That faculty is the power to think analogically, to perceive similarities in relationships, and to use the body as a semantic template. In short, if corporeal representation is the cornerstone of analogical thinking, and analogical thinking is the

cornerstone of symbolization, then it is a leap neither of fancy nor of faith to think that, far from being a matter of newly operating symbolic codes, learning rules, mental substitutions, or associations, symbolization was an extension of an already extant biological matrix. The flick-of-the-switch, light-bulb theory of symbolization, one that basically construes mind and body as antithetical Cartesian substances, fails to recognize this matrix, enshrining intelligence instead in a rarified mental essence belonging to humans alone. As I have elsewhere argued, "intelligence does not reside at such a doubly exclusive address" (Sheets-Johnstone 1986b: 9). It resides in living creatures, "persistent wholes" that are both human and nonhuman.

In sum, symbolization is latent in analogical thinking and analogical thinking is latent in corporeal representation. However revolutionary and strikingly original the practices of Moderns some 40,000 years ago, they are rooted in a mode of thinking that is modelled on the body, that gives rise to corporeal concepts, and that has its origins far back in evolutionary history. When the basic biological matrix of corporeal representation — a clearly apparent evolutionary feature of morphology as well as behavior[10] — is ignored, "the mental" is easily given dominion *über alles* and an entire body of evidence is stifled. Suppressed too is an appreciation of the evolutionary continuities that basically bind hominid to hominid and humans to nonhumans. So also is the fundamental evolutionary principle that there is nothing *de novo* in Nature. This emphasis on continuities does not mean that differences are unimportant — much less non-existent. It means only that difference is not equivalent to a lack of commonalities. In marking out differences, one must take care not to overlook the ties that bind us in a common evolutionary family or in a common creaturehood. These ties may in both a literal and metaphorical sense lie deeper than artifactual and fossilized surfaces, and in turn articulate evolutionary matters of fact not yet examined, discovered, or perhaps even imagined.

5. Animate form: Theoretical clarifications

The task now is to turn to living creatures themselves and show how deeper understandings of the relationship between bodies and movement — and in consequence deeper understandings of *animate form* — are critical to comparative studies in paleoanthropology. Deeper understandings are critical because the customary leap straight from morphology — fossil bones — to behavior — conjectured lifestyle — lacks a consistently solid empirical foundation. Indeed, "the mere possession of an anatomical part does not guarantee any particular behavior" (Sheets-Johnstone 1983: 205).[11] What it does guarantee, presuming the part and the body as a whole are intact, are certain movement possibilities and not others. To identify and describe these kinetic possibilities is ultimately *to delineate a particular kinetic domain of dispositions*. These

movement dispositions exist because, whatever the range of possibilities, certain kinds of movement are more congenial and efficient given the body one is. While kinetic domains among both close and more distantly related species may obviously overlap, dispositions are less likely to do so. In other and broader terms, no group of hominid bodies is kinetically unique through and through, but no group of hominid bodies lacks definitive kinetic distinction. Hence, both kinetic commonalities and differences require attention.

Now if one can differentiate one group of hominids from another on the basis of movement dispositions, then certainly a vocabulary should exist for describing movement in comparative terms, a vocabulary commensurate with the vocabulary specifying relationships among morphologies (e.g. plesiomorphies, synapomorphies, autapomorphies, and so on). The purpose here is not to propose such a vocabulary of relationships, but rather to sketch out what bodily characters might enter into a delineation of movement dispositions, hence to identify features that might basically define a kinetic domain, and by extension, specify the lines along which a distinctive kinetic vocabulary might be drawn. It might be noted that in the same way that, as Trinkaus and Smith observe, "it is possible to make behavioral interpretations [on the basis of morphological evidence] irrespective of the actual phylogenetic relationships between the Neandertals and early modern humans" (Trinkaus & Smith 1985: 330), so it is possible to make kinetic interpretations irrespective of these same phylogenetic concerns.

An important theoretical and methodological distinction attaches to this kind of investigation. It was suggested earlier that in opting for "learning rules" and other such "abstractions" to specify the source of our uniqueness, Gould avoids the necessity of a typical sociobiological adaptationist explanation of the difference between us (Moderns) and them (Ancients). But it was also pointed out that in opting for abstractions, Gould hazards another kind of liability. That other kind of liability is evident in the required separation of "the mental" from "the physical" in order to arrive at an adaptive account at "the right level of abstraction." The important theoretical and methodological distinction hinges on demonstrating an alternative to Gould's "abstraction" strategy. In particular, there is a quite different way of avoiding adaptive catechisms, a way that, in addition, challenges the classic Western metaphysical dichotomy. Moreover this alternative approach has an even further significance. In avoiding the catechisms and in challenging Procrustean received Western wisdom, the alternative approach bridges what is otherwise an empirical void by opening up a new field of study, one that hews to corporeal matters of fact and attempts to do them full justice. Rather than itemizing the body part by part, supplying in turn a specific answer to the question "what is it (the part) good for?" and rather than itemizing conjectured behaviors in the same fashion, one considers the body as a whole and specifies its movement possibilities: *given a particular morphology, certain movement possibilities obtain and not*

others. Specifying these possibilities is not the same as specifying the adaptiveness either of a given morphology, part by part, or of given conjectured behaviors. Although, in a kinetic sense, the question "what is it good for?" is still asked — i.e. what does this body allow in terms of movement? — the answer is of a different nature altogether, for what is of moment is both an intact organic whole and a corporeal matter of fact. For example, throwing as a real-life happening is not simply an arm movement; it is a *whole body movement*. By the same token it is not simply a behavior that has a functional significance of some kind or other and is duly fixed within a certain category — e.g. subsistence, sexual signalling, defense. Hence, it is not an act that is already pegged, so to speak, that has already been assigned its place in a creature's behavioral economy. To identify and describe movement possibilities is to ask what such and such a body allows in the way of movement and thereby ultimately define a certain repertoire of "I cans" (see Introduction, Note 3). The end result is thus not catechisms, but potentialities. Being descriptive rather than explanatory, the delineation of kinetic domains leaves open the question of adaptiveness. At the same time, however, *the delineation provides the empirical ground on the basis of which any answer to the question of adaptiveness must be assessed*. Precisely because it is a matter of understanding a living body in its living wholeness, what emerges from an attention to movement is a dynamic sense of how a creature lives or lived, what its repertoire of "I cans" allows or allowed, and what its particular kinetic dispositions are or were likely to have been.

Clarifying movement possibilities in this way (and indirectly, clarifying movement impossibilities and indispositions) results in clarifying corporeal matters of fact such that conjectured behaviors are in the end anchored in corporeally dynamic rather than categorically static facts of life. When it comes to empirically grounding paleoanthropological reconstructions, abstract formulations are clearly no match for corporeal matters of fact. Indeed, one can hardly speak of any *concrete constituents* of once-real evolutionary dramas in a language of abstract formulations. In hewing to corporeal matters of fact, one gains the insight that, in the same way that no body can speak a language for which it is unprepared, no body can move in ways for which it is unprepared; hence, no body can discover tactile-kinetic concepts — *nonlinguistic corporeal meanings* — for which it is unprepared. Corporeal matters of fact from this perspective are not mere items in a catalogue of the physical; they are facts about animate life, creaturely forms having certain potentialities of movement and not others in virtue of being the bodies they are, and in turn, having certain conceptual potentialities and not others. In sum, to bring fossil bones to kinetic life is to show how, given a certain skeletal form, a certain repertoire of "I cans" obtained, how within the compass of those kinetic capacities, certain ways of living were kinetically more congenial and efficient than others, and how, tethered to those fundamental kinetic dispositions, was a specified range of corporeal concepts.

A topical illustration of the morphological-kinetic-conceptual schema is readily available. Neandertal front teeth are consistently described as large and efficient tools used for a variety of "paramasticatory purposes" (Trinkaus & Smith 1985: 330) such as clamping and gripping. C. Loring Brace and Ashley Montagu in fact describe them as "the Lower and Middle Pleistocene equivalent of the Boy Scout knife," stating that "[i]t seems likely that they were used to crack nuts, peel bark, squeeze, scrape, pry, and cut a variety of objects, and also to tan rawhide" (Brace & Montagu 1965: 248). Given their broad utility and on-the-spot availability, we may ask why a Neandertal would spend energy and time making stone equivalents? Such an endeavor would indeed involve not merely time and effort in making the equivalents, but time and effort in looking for proper materials to begin with, in forging a diversity of stone forms specifically tailored to the use each would be put, in carrying such forms about to places they are or might be needed, in devising places to stash them when not being used, and so on. In short, if all the various acts of scraping, peeling, squeezing, and so on, were readily performable *dental* acts — in other words, if the body itself was diversely capable on the spot — then certain ways of living consistent with those diverse capabilities would be more congenial and efficient than other ways, i.e. more congenial than creating a diversified and elaborate stone tool-kit that in many (though not necessarily all) instances would merely duplicate the instrumental proficiencies of one's own teeth. Moreover such a tool-kit would in practice mean *moving* differently from the congenial and efficient ways of moving already practiced; wielding stone tools is different from using one's teeth. Furthermore, if Neandertals used their teeth in such ways as Brace and Montagu describe, then they necessarily had a corporeal concept of cracking, of peeling, of squeezing, and so on.[12] They were thus not at a loss conceptually any more than they were at a loss instrumentally. In effect, the judgment that Neandertals were deficient in their stone tool-making insofar as "they did not elaborate their material culture" (Stringer & Gamble 1993: 199)[13] ignores corporeal matters of fact and their conceptual and technological implications. Indeed, the judgment fastens on the notion of progress — or rather, lack of progress — toward the "*summum bonum* of bigger brains" and pronounces a pejorative verdict accordingly.

Anthropologist William Howells once wrote that "Hands and a big brain would not have made a fish human, they would only have made a fish impossible" (Howells 1959: 341; for a philosophical essay developed along the lines of Howells's remark, see Sheets-Johnstone 1986a). Though speaking about levels of neural organization and not about animate form, Howells's remark rings in the present context with a particular truth. Animate form is the proper starting place for paleoanthropological reconstructions, the central and critical key to understanding the lives of once-living creatures precisely because it does justice to movement possibilities and dispositions, and to the persistent wholeness that is their foundation.

6. Animate form: Neandertals

Neandertals bodies are consistently described postcranially in terms of their robusticity, their power grip, the shortness of their distal limb segments, and their distinctive pelves (Rak 1987; Rak 1993; Trinkaus 1983; Trinkaus & Smith 1980). References to movement in the context of these descriptions are sparse and brief. Indeed, movement is not an item in any index of any book on Neandertals, any more than it is an item in indices of books on paleontology or paleoanthropology generally. The subject is consistently skirted even in places where it appears to be the topic of direct concern. Stringer and Gamble's sixteen-line section titled "Posture and movement" (in *In Search of Neanderthals*) is a case in point. Except for a passing reference to "squatting," and a reference to "strong movement" (the meaning of which is not exemplified), the brief section concerns itself with anatomy — with the structure of the shoulder blade, for example, and the way the pelvis "may be related to the different way in which the hip joint operated" (Stringer & Gamble 1993:93) — and not with either movement or posture. Indeed, that there is a realm of movement to be explored and understood is readily attested to by its being nowhere in evidence.

The closest approximation to an awareness of the paleoanthropological significance of movement, and in particular, the movement style of Neandertals, is to be found in a 1959 article by anthropologist Alice Brues titled "The Spearman and the Archer — An Essay on Selection in Body Build." In the context of discussing body build in relation to tool type, Brues focuses attention on specific kinetic acts and gives specific kinetic definition to precisely such terms as "strong." At one point, for example, she describes strength in terms of defensive action. She links strength of body build with "static defense," the creature "stand[ing] its ground instead of fleeing" (Brues 1959:458). She illustrates how laterality of build that is favorable to static defense is oftentimes linked to increasing size, citing the gorilla as an example (Brues 1959:458). She notes at a further point, in a discussion of how, in a creature without weapons such as a gorilla, "[the magnitude of] destructiveness is [proportional] to the amount of squeezing or crushing force exerted momentarily on the fragile parts of the victim." She astutely points out in this context that a gorilla's physique "drastically reduces speed of locomotion," with the effect that, "though he could kill anything he could catch, he cannot catch anything" (Brues 1959:462). In brief, discussion turns on actual movement, what creatures can and cannot do. Though Brues does not go on to distill movement dispositions from these "cans and cannots" — nor indeed speak in terms of a repertoire of "I cans" — it is clear that such repertoires and dispositions quintessentially characterize the human and nonhuman animals she describes. In this respect, her analyses readily demonstrate a seminal attention to animate form. An implicit concern with kinetic and potential energy undergirds her discussions along with an explicit concern with movement possibilities, possibilities not only of "squeezing or crushing," but of "crashing through"

"leaping," "climbing," "running," "drawing [a bow]," and so on. It should be emphasized that it is not a matter of throwing in a few movement terms here and there in the course of a discussion about body build; the discussion itself is anchored in movement such that a distinct sense emerges of what is kinetically entailed in being a particular kind of body. Furthermore, in the use of words such as "strength," and in descriptions of what are usually simply termed "behaviors" — e.g. "hunting," "striking" — the same distinct kinetic entailments are evident.

It bears emphasizing that Brues was *not* proposing that body build correlates *only* with the disposition to produce and to use a particular type of weapon. In view both of what she writes about body build and of the disclaimers and admonitions with which she concludes her research, anthropologist David Frayer errs in attributing to her such a proposal; Brues never claims that "body size changes are related only to the adoption and use of weapon types" (Frayer 1981:69). Not only does she temper her research conclusions by an awareness of their provisional nature, but she states explicitly both that her suggested correlations "should be critically questioned" and that other factors entering into selection "must be considered jointly" (Brues 1959:469). In this context, she mentions climate. In fact, she has already taken the environment into account — in terms of terrain as well as climate — in describing movement possibilities; for example, in speaking of the kind of place in which "the original specialization of the human leg took place," she speaks of "an open prairie country where continuous running and leaping were possible" (Brues 1959:461).[14] The point is important. Where the focus is on movement, *where one thinks in terms of the movement possibilities of animate forms*, then terrain and climate enter naturally into the discussion. These factors are of indisputable import to an understanding of Neandertals. What one can kinetically do and not do, and similarly, what one is kinetically disposed to do and not to do, are intimately related to environmental conditions, to *circonstances*, as Lamarck would have put it (Lamarck 1963). A study of movement thus necessarily — by its very nature — considers organisms *in situ*, as making their way in the context of a certain topography and climate. It thus joins together causal (selectional) factors that are typically conceived and treated independently of one another. The idea that one must specify *either* thermal regulation *or* biomechanical advantage as causative agent with respect to the morphology of Neandertals is a prime example of typical practice (e.g. Trinkaus 1981). Where movement conceptually anchors the analysis, the idea collapses as a viable working principle.

Thinking in terms of movement one indeed reconstructs in corporeally dynamic terms rather than in categorically static ones. By the same token, one reconstructs holistically, in non-divisionary metaphysical terms. As we have seen, the degree to which the mental and the physical are typically disjoined in paleoanthropological reconstructions is readily exemplified by the cognitivist vocabulary and emphasis with which Neandertals are rendered less than human. Further analysis of Neandertals in

terms of animate form will show clearly that paleoanthropological reconstructions can find firmer ground in corporeal matters of fact than in typical divisionary thinking and that the quest to describe "what it was like" (to be such-and-such a hominid) can be far better satisfied.

From virtually the moment of their original discovery, Neandertals have been regularly conceived and are still conceived by many as being mentally deficient in one way or another. They are conceived to have *lacked* something cerebral — something in the way of thoughtfulness — since they did not "improve" in major ways or accede to our 20th century human kind of behavioral capabilities. It is as if, given all the time they had at their disposal — all the time they walked the earth — they stood pat; indeed, we are told that "in terms of hominid colonization, [it was] half a million years or more of inaction" (Stringer & Gamble 1993:215).[15] Considering the esteem in which earlier hominids (*Homo habilis*, *Homo erectus*, not to mention australopithecines) are generally held, the negative judgment is odd,[16] but it is especially odd when coupled with comparative statements concerning the singular abilities of *Homo sapiens sapiens*: their colonization of new areas, for example, their future planning abilities, their sophisticated social networks that insured survival in challenging times, and so on. The negative judgment is especially odd because Neandertals were around for more than 200,000 years (approximately 250,000 to 35,000 BP). That is not a long time in evolutionary terms, but it is a very long time when measured against our own human evolutionary life span of 40,000 years. Indeed, we modern humans have existed less than one quarter of the time that Neandertals existed. In contrast to Neandertals, early *Homo sapiens sapiens* are described in glowing terms that apply still to us since we are their descendants. Thus prized abilities — the ability to plan ahead and to form social networks, for example — are implicitly if not explicitly taken to be features of our own lives, and this in spite of contravening evidence. For example, any quick appraisal of the present global environmental situation readily instructs us that many humans are singularly deficient in planning ahead; they see only as far as their own immediate desires and/or their own lifetime. Moreover rather than building social networks that give them "insurance policies" (as Stringer and Gamble put it; 1993:210) against hard times, humans on the whole appear unkindly disposed if not hostile toward their national and ethnic neighbors, unduly acquisitive, and to have been at war almost incessantly as far back as history records. Furthermore, social networks in the form of treaties between or among nations have proved notoriously unreliable "insurance policies." In short, from a Martian or otherwise more objective viewpoint, modern humans in recorded history appear to be socially and ecologically deficient creatures who are more properly defined as selfishly engaged rather than either future-oriented or socially congenial. However revolutionary, stunning, and undeniably wonderful the practices and inventions of early modern humans, practices and inventions of those

latter-day humans who are their descendants arouse — or should arouse — wonder of an altogether different sort. There is every reason to doubt rather than marvel at their so-called "fundamental behavioral capabilities" and "improvements," their "learning rules," and the like. In fact, there is every reason to wonder whether *Homo sapiens sapiens* will match the evolutionary longevity of Neandertals.

The point is not deflective in the least to the topic at issue. What we humans want to claim for ourselves are clearly the *summum bonum* brains of which Gould speaks. We do this by mental comparison — and by a selective perception and amnesia that allow us to identify ourselves only with what we find mentally praiseworthy in the past. Thus it is that *the* significant differences distinguishing modern humans from Neandertals are not *physical* differences but illustrious mental ones that appear *ex nihilo*.[17] This is why *abstract* formulations can be formulated as they are — not only in a mental vacuum and honorifically on behalf of *Homo sapiens sapiens* alone, but as if they specified indelible features of all modern human minds, thus features in whose glory present-day humans may bask since it was "our kind" who mentally distinguished themselves. Clearly, what is at stake and what the comparison secures is "the traditional *summum bonum* of bigger brains … because bigger brains are so good to have" (Gould 1994: 27). In thoroughly supportive fashion, received Western wisdom teaches that quintessentially significant differences are "in the head" and have nothing to do with bodies. This is why Stringer and Gamble can write in answer to their question, "Where did modern behaviour originate?" that "[W]herever new developments took place they did so rapidly (the flick of a switch), *adapting to the anatomy of modern humans that had been around for perhaps 70,000 years*" (Stringer & Gamble 1993: 218; italics added). Great new ideas arose with "the flick of a switch" and adjusted themselves to the corporeal packaging in which they found themselves, the modern human's mind adapting itself swiftly and efficiently to the body in which it happened to be. In this metaphysically divisive way, modern humans find the kind of reasons they seek for cherishing themselves. What they want to cherish is "the mental," the kind of mental that churns out learning rules and mental substitutions, that bequeaths unique and remarkable ingenuities in the form of symbolic behaviors and unique and remarkable abilities such as the ability to plan ahead. They do not seek reasons for cherishing themselves *physically*, except by disdaining what they consider unattractive: prognathous features, no chin, squat build, and so on.

It is ironic that, in his article, "Evolution by Walking" — a review of a newly instituted exhibit of fossil mammals at the American Museum of Natural History — Stephen Jay Gould emphasizes precisely a view of evolution that does *not* give preeminence to modern humans, either "temporally" (they are the latest and thus most intelligent arrivals) or "morally" (i.e. they are "higher" rather than "lower" forms of life). He lauds the cladistic arrangement of the exhibit fossils; they are organized in

their chronological order of branching, and not in terms of "their later 'success' or 'advancement'" (Gould 1995: 13). Accordingly, as visitors walk through the exhibit, they do not figuratively climb "a ladder of putative advance" (Gould 1995: 14). They walk through evolutionary time and learn in and by walking, the proper evolutionary place of humans. This seemingly quite novel key idea — that we learn in and by moving — is expressed at the end of the article by the thought that "cogitation and ambulation" go hand in hand (Gould 1995: 15). But Gould has in fact already extolled the idea of "using the visceral to grasp the cerebral." Much earlier in his article, he specifies that "*in order to illustrate a concept*," one moves the body directly through the process or phenomenon of interest (Gould 1995: 10; italics added).

Now if movement can *illustrate* a concept, then might not movement *generate* a concept in the first place, that is, might a concept not have in fact originated in the course of moving or having moved? Not only why but how otherwise would movement possibly be able to illustrate a concept? In a broader sense, might not the most fundamental practices and beliefs of any particular hominid group have been forged in the context of moving and having moved? If so, then in the most basic sense movement possibilities and dispositions delimit one's conceptual possibilities and dispositions. Again, if so, then morphology — whether a matter of living creatures or fossilized specimens — must be ultimately conceived in terms of *animate form*.[18]

Gould's idea of a tight and intimate connection between thinking and moving clearly coincides with the sequence of ideas proposed earlier: in the most fundamental sense, thinking is modelled on the body, in particular, the tactile-kinesthetic body. Animate form is thus at the core of what traditionally passes for strictly cerebral activity. Such an idea is latent not only in Gould's article. It is latent in articles by paleoanthropologists and other researchers. In "Technological Changes across the Middle-Upper Palaeolithic Transition: Economic, Social and Cognitive Perspectives," for example, Paul Mellars notes that "over large areas of Europe, the major changes in both the anatomy of the human populations, and the technology of the associated archaeological assemblages, can be shown to have occurred over at least broadly the same range of time — i.e. broadly between c. 40 000 and 30 000 BP" (Mellars 1989: 338). This idea — that morphology and technology are linked — is actually evident to any perceptive and non-Cartesian-thinking reader who compares two illustrations that Mellars includes in his article. The backed knives (Figure 20.2) representing the tool industry of the Neandertals are squat, bulky, indeed, *robust* tools (Mellars 1989: 344); the points and crescents (Figure 20.3) representing the tool industry of early modern humans are lithe, elongate, indeed, *gracile* tools (Mellars 1989: 346). Tool morphology matches body morphology; the correspondence is palpable.[19] Mellars himself, however, does not make the connection. Instead, he leaps precipitately over the traditional metaphysical chasm to arrive at "symbolic 'meaning'," at the idea that Upper Palaeolithic humans, in contrast to Middle Palaeolithic people, "imposed form" on

their raw materials and thus attained to "symbolism and symbolically defined behaviour" (Mellars 1989: 358–60). He attributes the new "cognitive factors" that mark the transition from "'archaic' to 'modern' human populations" to "some kind of fundamental change in the basic structure of human thinking" (Mellars 1989: 357). The idea that thinking could have something to do with the body — or the body with the mind — never surfaces.

The morphological-technological connection is a clear validation of analogical thinking. It is a validation of corporeal representation. Subsistence tools of Neandertals and early modern humans were in the image of their own bodies; their own bodies were semantic templates. When we allow the tools to speak for themselves, they speak unequivocally of this relationship. In this respect, they also speak of distinct differences. Neandertal tools were created not so much in terms of the linear *contours* of the body as in the image of its *bulk*. Moreover they were accessories to rather than extensions of the body; they were, in other words, auxiliaries of a body that was already instrumentally proficient, already by itself a most effective tool. Sheer strength and bulk were at the ever-ready disposal of this body. So also were teeth that could be used in a variety of non-dietary ways. In effect, whatever might be necessary to eking out a living, defending oneself, or dealing with the world, its instrumental point of origin was the body itself. That the tool kit of Neandertals did not change appreciably over 200,000 years is readily understandable in terms of this fact. As pointed out earlier, what need is there to devise ever more sophisticated tools — to take time to look for the proper stone, to take time to flake it in such and such a way, to make the effort to carry it about, and the like — when one has a variety of efficient tools ready-to-hand at the moment one needs or wants them? Moreover why would a labor-saving device in the form of a lever, for example, be thought of if one could immediately pick up the small boulder and move it by oneself? When we think of brawn, we might tend to think of it as antithetical to brains — much like thinking of a linesman in football as compared to a quarterback, for example. But this divisionary thinking misses the point. If one's build and size afford one a reliable effectiveness, if what is there naturally is not only basically sufficient but ever-ready, why would one be disposed to tinker about with the idea of forging something new? What need is there to fashion a complicated tool kit for tasks in which one's own body constitutes tool enough? It is not a matter of brawn versus brains or brains versus brawn. It is a matter of understanding kinetic domains and the movement dispositions of animate forms.

Now the idea of a conceptual linkage between morphology and technology may suggest an absolute synchronization of anatomy with culture, any change in the latter being immediately coincident with a change in the former. The suggestion is erroneous and simplistic on several inter-related counts. To begin with, culture is not reducible to technology. As Stiner (1994) has shown in extended detail, a good deal more is involved in the establishment of, and in the continuity or changes in,

cultural practices — specifically those associated with subsistence — than stone tools. Environmental change, land use, and mobility, for example, are highly significant variables. So also are prey focus and prey availability. Absolute synchronization of anatomical and lithic change could occur only in the absence of such fundamental and critical factors. Thus, that anatomically modern humans were present *before* the advent of a modern tool kit, for example, does not contravene the basic idea that hominids made stone tools in the image of their bodies or the ample evidence on which it is based: a palpably visible congruity of bodily and lithic morphologies. Second, recognition of the formal analogy between body morphology and subsistence tools entails no correlative claims about boundaries or watersheds. The typically drawn "boundary" between Middle and Upper Paleolithic is literally set in stone; in other terms, the Neandertal-to-modern human "transition" — be it defined in terms of continuity or replacement — has been evidentially marked primarily on the basis of a difference in stone tool kits. Newer studies question the narrowness of this perspective, not only in terms of there being other highly significant factors to consider as indicated above, but in terms of construing the Neandertal tool industry (the Mousterian) "as a monolithic, static thing" (Kuhn 1995: 171) — not to say a "robotic" thing (Kuhn 1995: 156) — that remained unchanged for thousands of years. In short, the boundary itself is open to question as a readily and exactingly delimitable and fixed moment in hominid evolution, a moment that marks both a lithic watershed and a correlative "mental" watershed dividing a "primitive or ineffective" (Kuhn 1995: 171) intelligence from an intelligence that is advanced and powerful. As noted above, recognition of the formal analogy between body morphology and subsistence tools carries with it no temporal claims about stone tool typology as an evolutionary or "mental" boundary marker, hence no claims that a certain kind of tool kit makes its entrance and exit in precise temporal concert with the appearance and disappearance of a certain kind of body. To say that stone tools were modelled on the body in the course of hominid evolution is no more than to acknowledge what is evidentially apparent in paleoanthropological and archaeological data: a basic *formal* analogy between the bodies of anatomically modern humans and *their* tools and between Neandertal bodies and *their* tools. More broadly, it is to say that one designs tools congenial to the body one is, not to the body one is not; equally, one designs them congenial to the use they will be put *and can be put given one's situation*, not to a use that is impossible in virtue of either the environment in which one lives, for example, or of the kind of prey that is available. Third, the relationship between morphology and technology is precisely *not* a "flick of the switch" relationship. Such a relationship would require, *inter alia*, that certain infants at certain times be born as fully formed adults, with bodies radically different from their parents, and correspondingly, with radically different stone tools in their hands. On the contrary, infants

are born within a certain lineage, within a certain social tradition, within a certain ecological and climatic environment, and so on. The kind of stone tools made and used by particular groups within a species may certainly vary, but those variations do not suddenly negate the distinctive formal characters that define in a classic way a particular style of stone tool-making any more than morphological variations preclude classic definitions of species. Fourth, radical changes in stone tool-making, at least insofar as they become standardized and are not, for instance, a one-time-and-never-more-pursued accidental discovery, clearly involve conceptual elaborations on a particular pragmatic theme, be it hammering, stripping, grinding, or whatever. Like the pragmatic theme itself, these conceptual elaborations are clearly dependent on lithic resources, on the kind of prey species in the area, and on all those other variables mentioned above. There is, in effect, no reason to think that analogical thinking operates in a vacuum, that the moment a certain kind of body is present, it immediately begins churning out a certain kind of tool kit. The actual is tied to the circumstantially possible. But again, it is also tied in a fundamental sense to the realities of animate form. The tools one makes are the tools one can wield: tools that fit one's grip (however large or small, powerful or weak, for example), that fit one's style of moving (however fleet or heavy, long or short in endurance, for example), that fit one's range of movement (however flexible or constrained, ample or small, for example), and so on. In short, what one conceives and elaborates in the way of a tool is patterned on the animate form one is.

We should perhaps note that the basic formal conjunction is not contravened by the fact that anatomically modern humans were on the scene before their classic tool-kits were *or* that some Neandertals made tools similar to anatomically modern humans. Anthropologist Richard Klein's view that "the modern physical form evolved before the modern capacity for culture" and that "it was culture and not body form that propelled the human species from a relatively rare and insignificant large mammal 35,000 years ago to a geologic force today" (Klein 1989: 397) does not engender a substantive sense of "body form" in the full and detailed sense understood here; in other words, Klein's "body form" is not equivalent to animate form. Moreover although Klein disaffirms a connection between culture and "body form," he actually obliquely supports the idea of corporeal representation — or analogical thinking — when he writes in one instance that "The Upper Paleolithic contrasts with the Mousterian in many ways, of which the most often-cited is the widespread Upper Paleolithic emphasis on stone flakes whose length was at least twice their width" (Klein 1989: 356); and when he writes in another instance of how the "inferior" behavior of Neandertals might be connected with their "distinctive morphology": "the Neanderthals were behaviorally inferior to their modern successors, and, to judge from their distinctive morphology, this behavioral inferiority may well have been rooted in their biological makeup" (Klein 1989: 334). His negative judgment of Neandertals aside — and his implicit idea of a hominid march toward "the