

psycology.94.5.08.evolution-thinking.1.sheets-johnstone Wed 26 Jan 1994  
ISSN 1055-0143 (23 paragraphs, 7 references, 495 lines)  
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**Precis of:**  
**THE ROOTS OF THINKING**  
**Temple University Press 1990**  
**15 chapters, 389 pages**

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**ABSTRACT: This interdisciplinary book addresses the question of conceptual origins. Its thesis is that there is an indissoluble bond between hominid thinking and hominid evolution, a bond cemented by the living body. The thesis is illustrated in detail in eight paleoanthropological case studies ranging from tool-using/ tool-making to counting, sexuality, representation, language, death, and cave art. In each case, evidence is brought forward that shows how thinking is modeled on the body; specifically, how concepts such as the concept of number, of death, of drawing, and of oneself as a sound-maker are generated by animate form and tactile-kinesthetic experience. The two major forms of opposition to the thesis--cultural relativism and metaphysical dualism--are in turn critically examined and put to rest. Methodological issues are also critically examined and the expanded paleoanthropological methodology that informs the paleoanthropological case studies is fully spelled out.**

KEYWORDS: analogical thinking, animate form, concepts, evolution, tactile-kinesthetic body.

## I. HOMINID THINKING AND HOMINID EVOLUTION

1. Sheets-Johnstone (1990) is about conceptual origins. In particular, the book addresses the question of the conceptual origin of fundamental human practices and beliefs that arose far back in evolutionary human history: stone tool-making, counting, consistent bipedality, language, burying the dead, engraving and painting. Typically, answers to question about origins--how a verbal language originated, how counting began, for example--take for granted the very concepts basic to the practice, the concept of oneself as a sound-maker in the case of language, for instance, or the concept of numbers in the case of counting. Insofar as fundamental human practices and beliefs entail concepts, and insofar as concepts entail some form of thinking, a proper account of the origin of any particular human

practice or belief must necessarily give an account of thinking, that is, an account of the standard in terms of which the relevant concepts were forged.

2. The thesis of this book is that in each case the living body served as a semantic template. Concepts were either generated or awakened by the living body in the course of everyday actions such as chewing, striding, standing, breathing, and so on. As everyday actions gave rise to new concepts, so new concepts gave rise to new possibilities, new possibilities to new ways of living, and new ways of living to the establishment finally of those revolutionary new practices and beliefs that are definitive of hominid evolution. The broad thesis of this book is thus that there is an indissoluble bond between hominid thinking and hominid evolution, a bond cemented by the living body.

3. The thesis of the book is substantiated by eight paleoanthropological case studies. These demonstrate in fine detail how the same evidence that supports hominid evolution supports the thesis that thinking is modeled on the body. They show that concepts fundamental to hominid thinking have their origin in animate form and in the tactile-kinesthetic correlates of behaviors regularly attributed to our hominid ancestors on the basis of fossil and artifactual evidence. Stone implements, burial remains, cave paintings, skeletal fragments, all attest not just to various behaviors such as upright posture and locomotion, tool-making, and pictorial depiction--or suggest others, such as the possibility of language and counting--but they attest to specific tactile-kinesthetic concepts subtending the behaviors or generated by them: the concept of edges, of death, of numbers, or of oneself as a sound-maker, for example. Accordingly, just as without evolution there would be no human thinking, so without thinking, there would have been no hominid evolution.

4. The key to an understanding of the dynamics of the reciprocal relationship between hominid thinking and hominid evolution lies in deepened understandings of the body, specifically in corporeal analyses of a hominid animate form and tactile-kinesthetic body. Thinking is thus linked to spatial and sentient-kinetic life. This fresh approach to an understanding of thinking attempts to crack the noetic code, as it were, by tracing its evolutionary roots, at the same time critically recognizing and in turn jettisoning traditional schisms embedded in the received wisdom of twentieth-century thought. The approach poses different questions because it starts not only from the beginning, but with what is obvious in the beginning. Seminal evolutionary changes in practice and belief that mark the historical development of hominids were made possible not by "a greater intelligence" or "by a more sophisticated consciousness" but concretely by new ways of thinking. In each instance, conceptual touchstones necessarily provided the impetus: the concept of sound, of articulatory gestures, and of oneself as a sound-maker necessarily anchored the invention of a verbal language; the concept of numbers necessarily anchored the invention of counting; the concept of edges and of flaking (one stone with another) necessarily anchored the invention of stone tool-making; the concept of punctuated existence necessarily anchored a belief in death; the concept of drawing necessarily anchored the invention of engraving and painting.

5. The question is, Where did these concepts come from--from the concept of edges?, of flaking?, of a spoken language?, of numbers?, of a punctuated existence?, of drawing? Clearly, however accidental the circumstances of discovery or invention, new ways of perceiving and acting take root only in moments of conceptual insight. What "The Roots of Thinking" shows is that in each instance, insight was generated in tactile-kinesthetic experience, which is to say by the tactile- kinesthetic body--the body that through touch and movement distinguishes not only a rubble of stones from no rubble at all as it walks the earth, or the making of sound from no making of sound as it conceals itself from danger, but the body that distinguishes a sharp-edged stone from a blunt one, a quadrupedal stride from a bipedal one, a touching of lips in making the sound m from a touching of lips in making the sound p, and so on. That sensorily felt and sensorily feeling body was the cognitive source of those fundamental and preeminently human concepts that shaped human thinking and human evolution. That body was the standard upon which each new practice or system of beliefs was forged.

## II. CONTENTS

6. Part I of the book presents an overview of the theoretical and methodological terrain, laying out critical issues in the process. The topics of the following eight paleoanthropological case studies comprising Part II are: "The Hermeneutics of Tool-Making: Corporeal and Topological Concepts"; "On the Origin of Counting: A Re-Thinking of Upright Posture"; "Hominid Bipedality and Primate Sexuality: A Further Re-Thinking of Upright Posture"; "Corporeal Representation"; "On the Origin of Language"; "Hominid Bipedality and Sexual Selection Theory"; "On the Conceptual Origin of Death"; "On the Origin and Significance of Paleolithic Cave Art." The six chapters of Part III address in depth and in turn the theoretical and methodological issues identified in Part I.

7. It should be noted that an original bodily logos is demonstrated ontogenetically as well as phylogenetically throughout Part II; that is, though anchored primarily in paleoanthropological case studies, the chapters present evidence in both historical modes.

## III. AN EVOLUTIONARY SEMANTICS: AN EXEMPLARY SUMMARY OF FOUR PALEOANTHROPOLOGICAL CASE STUDIES

8. Because of the interdisciplinary scope and complexity of each of the case studies, and because the title of each of the studies already clearly designates its subject matter, it will be most helpful to summarize some rather than all of the studies. In this way, potential readers will gain a clear grasp of the central concerns of the book, its manner of treating those concerns, and, in effect, of the significance of a corporeal approach.

9. The third through sixth of the eight chapters devoted to paleo- anthropological case studies form a unit on what is called "an evolutionary semantics." The unit begins by

launching an examination of a posturally significant and behaviorally decisive aspect of hominid bipedality that has been consistently overlooked in assessments of its evolutionary impact. In particular, the examination shows how hominid bipedality eventuated in a radically different primate bodily appearance: male sexual characters relatively hidden in quadrupedal primates are visibly exposed in bipedal ones. Conversely, female sexual characters normally visible in quadrupedal primates are relatively hidden in bipedal ones. Loss of estrus, typically explained only by recourse to highly speculative scenarios, can in fact be explained on the basis of continuous and direct male genital exposure. The opening chapter of the unit demonstrates that the behavioral function of typical primate estrus cycling was replaced not by "year-round female receptivity," as is so routinely and commonly claimed, but by year-round penile display. The phenomenon of sexual signalling in primates, early hominids in particular, thus requires new analysis. The question of sexual signalling behavior in early hominids in fact demands to be addressed to begin with--in the same way that the question of the sexual signalling behaviors of other creatures is regularly addressed in studies of their life habits and modes of procreation. Indeed, the question of just how early hominids signalled sexual desire or readiness to one another can no longer be ignored. Consistent bipedality clearly changed typical primate signalling behavior.

10. The examination of consistent bipedality in terms of typical primate sexual postures and behaviors, basic evolutionary patterns in male sexual displays, and basic behavioral analogies and disanalogies between primate male hominid and nonhominid displays leads in turn to broader considerations of communication. The succeeding chapter on corporeal representation shows how bipedal penile display (a behavior not limited to early hominids but common to present-day male chimpanzees, originally under the description "bipedal swagger": Goodall 1968; Bingham 1928) is an example of a basic biological matrix, namely, the disposition of creatures to use their bodies as semantic templates, to represent meaning corporeally--through bodily actions, postures, orientations, and the like. Thus, early hominid sexual signalling behavior is actually situated in the broader context of an evolutionary semantics. An understanding of this semantics necessitates first of all a recognition of similarities--and thus ultimately continuities--in primate communicative behaviors. It further requires an extensive critical analysis of the privileging of human language since preferential treatment of the latter precludes not only an unbiased investigation of the similarities and continuities; it precludes acknowledgment and analyses of the body, which is the dynamic locus of communicative acts. The chapter on corporeal representation answers to this requirement. In the process, it shows how the disposition to represent meanings corporeally runs the communicational gamut from primate sexual display to primate gestural language to hominid primordial language (as reconstructed by linguists through phememic analyses: Foster 1978). It in fact shows that evolutionary estimations of nonhuman animal communication based on the privileging of human language (and note that these estimations wittingly or not necessarily include the communication of nonverbal or inchoately verbal ancestral hominids) are actually based on an ahistorical, Athena-like model: human language--whenever it is deemed to have arisen--arose full-blown from the mouths of ancestral hominids like the goddess Athena arose full-

blown from the head of Zeus. An Athena-like paradigm prevails because in such privileging schemes--the well-known design features of Charles Hockett's (1960) model of "communication systems" are used as an example--any elements found below the human stage do not have any status as speech (pro forma designations "pre-speech," "protospeech," "prelanguage," and the like, notwithstanding). Only the final confluence of all the features under one cortical roof constitutes speech and thus differentiates language from the mere sounds of other animals, earlier nonverbal hominids included. Prime effects of the privileging are discussed, such as the overriding of channels of communication other than the vocal-auditory one, notably those tactile, kinetic, and visual modalities whose seminal role in human and nonhuman animal communication is well documented.

11. In analyzing the presumptions and deleterious effects of a privileging of human language, the chapter on corporeal representation focuses attention on the semantics of communication and thereby restores a focus of attention to the body. In so doing, it shows how the seemingly trivial truism that whatever the form of animal communication it is always the result of a living body, expresses an axiomatic biological truth: meanings are not free-floating entities but are anchored in living bodies. Communication is effected through corporeally representation. Animate bodies represent by symbolizing the spatio-kinetic dynamics of their own experience (or the spatio-kinetic corollaries thereof). In this respect, the Tanzsprache of the honeybees--their dances relating information regarding honey sources--is no different from hominid primordial language, and both the Tanzsprache and primordial language are no different from the tongue--licking sexual display behavior of female howler monkeys or from the bipedal sexual display of male early hominids. In each case, tactile-kinesthetic experience and its spatio-relational correlates are iconically linked. An examination of the Tanzsprache is especially edifying in demonstrating these relationships both because its status as a symbolic communicative system has been contested and the subject of investigation for many years, and because in the long contentious debate, a basic corporeal dimension shared not only by primordial human language but by primate sexual displays has been overlooked.

12. Consideration of how corporeal representation is a basic biological matrix is directly relevant to a consideration of the origin of language precisely because language is consistently conceived to have been a matter of arbitrary sounds from the very beginning. The third chapter of the unit on an evolutionary semantics--"On the Origin of Language"--calls this conception into question. It does so initially by showing what the invention of arbitrary sounds would have required. To maintain that language was made up originally of arbitrary elements would have meant, for example, that preverbal hominids had a concept of the arbitrary as opposed to the nonarbitrary. That is, they must have had a concept of sound itself such that they could distinguish a gratuitous vocalization from, say, a practical one. To arrive at this nonverbal concept of sound, they would have to have experienced arbitrary and nonarbitrary sounds, which is to say they would have to have experienced their own or someone else's gratuitous vocalizations, and in the process, or as a result of those experiences, have realized that the sounds being made were not topical in any way

but were merely playful renditions, for example. The chapter goes on to question whether one would want to attribute such a seemingly sophisticated nonverbal concept to nonverbal ancestral hominids and in fact whether one would want to admit a nonverbal concept at all--notwithstanding the fact that the notion of arbitrary elements being at the foundation of human speech requires unequivocal affirmation in both cases.

13. An extended sensory-kinetic analysis of arbitrary and nonarbitrary sounds, and a consideration of the evolutionary implications of the analysis lead to the conclusion that arbitrary elements cannot be assumed with either epistemological or scientific impunity. On the contrary, a physiognomic congruency of sound and meaning appears to have been essential.

14. After examining critically the notion that human language arose with the creation of arbitrary sounds, the chapter critically examines the notion that human language is distinctively propositional rather than expressive. Reasons for doubting the validity of the distinction are pinpointed in terms of incompatibilities (with evolutionary theory), consequences (with respect, for example, to what might have preceded a propositional language in the way of sounds), situations in which one individual deceives another, and the phenomenon of behavioral propositionality (readily documented by play situations, close analysis of which shows that no creature so engaged takes the play behavior as anything but pretense behavior and no animal takes the pretense behavior as anything but real, thus turning what would otherwise be pretense-deception into pretense-play).

15. The chapter concludes by giving a sensory-kinetic model of the origin of language. This model, in brief, shows how an initially tactile, then tactile/auditory organ--the tongue--becomes witness to a preeminently visual world. Its articulations are of things or relationships seen. The most distant sensory world is thus brought within the realm of touch. The model furthermore includes a discussion of linguistic reconstructions of the symbolic structure of primordial language, which show that the meaning of original sound elements were the analogue of their articulatory gestures. The symbolic structure of primordial language was thus rooted in tactile-kinesthetic experience. 16. In the final chapter, concerned with an evolutionary semantics, the substantial implications of the radical reversal in visible male/female sexual morphology originating with consistent upright posture are examined with respect to sexual selection in hominids. In particular, penile display is examined within the purview of Darwin's original theory of sexual selection. As in all of the earlier chapters, studies of animal behavior are analyzed and interpreted in the light of animate form and tactile-kinesthetic experience. Of particular moment in the present context are entomological studies of male genitalia (Eberhard 1985) which, in addition to providing a rigorous and compelling explanation of why variations in male genitalia are significantly greater than variations in female genitalia, and underscoring the taxonomic significance of male genitalia, reinvigorate a Darwinian focus on evolutionary sexual morphology and give new meanings to comparative anatomy. They

show that male genitalia function as internal courtship devices, thus that there are differential spatial/tactile-kinetic (and tactile-kinesthetic) male genital potentialities.

17. The chapter "Hominid Bipedality and Sexual Selection Theory" examines four topics in detail: the bipedal incentive, the inverse relationship of nonhominid vulva to hominid penis, the biological significance of pleasure, and the uncommonly large (by higher primate standards) human penis as evolutionary product. In spelling out primate sexual analogies and disanalogies, it brings to a close the unit on an evolutionary semantics. It shows that consideration of the primate Bauplan imposed by consistent bipedality clearly and forcefully mandates a reappraisal of hominid sexuality: *Homo exhibiens* was an undeniable ancestor of present-day humans.

#### IV. THEORETICAL AND METHODOLOGICAL CONSIDERATIONS

18. Of the six chapters of Part III, "Theoretical and Methodological Issues," the first two (Chapters 10 and 11) deal in turn with the two major forms of opposition to the thesis of the book. The first form of opposition may be succinctly identified with an all-encompassing, steadfast belief in cultural relativism, the second with the all-encompassing, steadfast practice of thinking dualistically and reducing biologically. With respect to the first, the notion of getting back to the conceptual origins of human thought goes against academically popular dogma. What is shown in detail in Chapter 10 is that the various theoretical obstacles placed in the way of getting back are all in a robust biological sense biodegradable. Given animate form and the tactile-kinesthetic body, and given bona fide evolutionary theory and sound reasoning therefrom, the obstacles disintegrate. With respect to the second, the division of life into "the mental" and "the physical" has a long Western history. The division is held in place by academic practice: minds are treated by philosophers, bodies are treated by scientists, and rarely do the twain ever meet. Since in the traditional divisional scheme of things bodies provide little more than a dumb show of movement and minds are privileged shrines vouchsafed to humans alone, any resemblance between ancestral hominids and present day ones is purely physical.

19. Metaphysical dualism and academic practice open the door to a piecemeal, reductive approach to the body. Separate physical characters are singled out and their separate evolutionary histories told, each one in turn being given an adaptive role. What Chapter 11 shows is that the failure to think in what the eminent biologist J. S. Haldane (1931) termed "persistent wholes" is to do injustice to the living, intact creatures in question. It shows that with academic institutionalization of metaphysical dualism, the body is not given its due. At the same time, it shows through a reexamination of Darwin's three major writings on evolution that an institutionalized dualism is nowhere to be found in the original formulations of evolution theory, and that the present-day practice of reading Darwin in a highly selective manner--a practice nowhere acknowledged or methodologically justified--is a further way of failing to give the body its due. The end result is the propagation of

unnatural species: academically-spawned creatures that are in essence mindless bodies on the one hand and disembodied minds on the other.

20. The thesis that thinking is modeled on the body provides in skeletal form the outlines of a bona fide philosophical anthropology. Corporeal analyses--the paleoanthropological case studies--provide its backbone. Chapter 12, "The Case for a Philosophical Anthropology," spells out how an interdisciplinary approach is required to create a sound, vital, and ongoing philosophical anthropology.

21. The three final chapters of the book are concerned with methodology. The first of these chapters shows that access to the conceptual lifeworld of ancestral hominids is had initially through a hermeneutic methodology, a methodology that is in every sense complementary to traditional paleoanthropological methodologies. Such a methodology is best described as an elucidation of that system of double meanings that comes into play wherever interpretations are made because in such situations, the data play a double role: an original datum (a fossil specimen, for example) is interpreted; that interpretation (the age of the specimen, for example) becomes a datum and is in turn interpreted (the fossil is placed within a certain period of evolutionary development); and so on. That this hierarchy of interlocking interpretations exists in paleoanthropology and archaeology is patently evident in the different levels at which controversy takes place and in the fact that dispute at any one level affects all others. Put in methodological perspective, hermeneutical explications are clearly not exercises in fancy but are grounded in a hierarchy of interpretations traditionally beginning (so far as ancestral hominids are concerned) with fossil or artifactual evidence, and ending precisely with those behaviors and evolutionary meanings that fossil bones, tools, monuments, or paintings, for example, are seen concretely by paleoanthropologist and archaeologist alike to memorialize: upright walking, the fashioning of implements, and so on. What the first of the chapters on methodology demonstrates is that full-scale hermeneutical analyses are needed to provide for paleoanthropological reconstructions a more substantial and more finely structured bridge, from original datum to associated conjectured behaviors, and from associated conjectured behaviors to their expanded and often complex evolutionary significance. Such analyses uncover the conceptual terrain engendered by or essential to the behavior both as a corporeal reality--a once actually lived-through event--and as a habitual life pattern--a consistent, established manner of acting. Traditional paleoanthropological hermeneutical methodology is thus carried one step further to generate corporeal analyses. The analyses work backward from data (stone tools, cave paintings, primitive counting systems, and so on) to the hominid body that produced them.

22. It is not sufficient, however, merely to affirm certain relationships; for example, to point out a functional replacement of teeth by tools in accounting for the conceptual development of stone tool-making. It is necessary to show in a precise way how each relevant concept would arise, thus how the concept of teeth as tools would arise, for example, and correlatively, how the concept of a stone as a potential tool would arise. A full-scale

paleoanthropological hermeneutics thus needs further evidential grounding through a method akin to genetic phenomenology. What this phenomenological analysis brings to light is the conceptual linkage, even the rational connection, between artifact (or behavior) and body. That the connection is conceptual and that it has an experiential base and can thus be empirically anchored in the realities of everyday corporeal life, are obvious but neglected facts that the chapter on genetic phenomenology spells out in detail.

23. The final chapter, "The Case for Tactile-Kinesthetic Invariants," presents detailed evidence supporting the existence of nonlinguistic tactile-kinesthetic conceptual invariants. It shows conclusively that these corporeal concepts are not in the least inferior to their linguistic relatives. What is required to appreciate this fact is a corporeal turn. Like the linguistic turn earlier this century, a corporeal turn requires paying attention to something long taken for granted.

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