WHEN METAPHORS BEWITCH, ANALOGIES ILLUSTRATE, AND LOGIC FAILS: CONTROVERSIES OVER THE USE OF METAPHORIC REASONING IN PHILOSOPHY AND SCIENCE

by

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A DISSERTATION

Presented to Department of Philosophy
and the Graduate School of the University of Oregon
in partial fulfillment of the requirements
for the degree of
Doctor of Philosophy

December 1998

"When Metaphors Bewitch, Analogies Illustrate, and Logic Fails: Controversies over the use of Metaphoric Reasoning in Philosophy and Science," a dissertation prepared by Timothy Charles Rohrer in partial fulfillment of the of the requirements for the Doctor of Philosophy degree in the Department of Philosophy. This dissertation has been approved and accepted by:

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An Abstract of the Dissertation

Timothy Charles Rohrer for the degree of Doctor of Philosophy

in the Department of Philosophy to be taken December 1998

Title: WHEN METAPHORS BEWITCH, ANALOGIES ILLUSTRATE, AND LOGIC FAILS: CONTROVERSIES OVER THE USE OF METAPHORIC REASONING IN PHILOSOPHY AND SCIENCE

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I begin by investigating the conventional view of the relationship between metaphor and natural kinds in both classical and contemporary philosophy of science. I argue that Plato and Aristotle originated the conventional view that metaphors are a peripheral and ornamental supplement to philosophical and scientific argumentation proper. On their accounts philosophy and science are supposed to be about tracing the causal and logical (as opposed to the metaphorical and analogical) connections between the objects of knowledge. Because metaphors are seen as improper categorizations made merely for the purposes of rhetorical persuasion, metaphors are considered obstacles to proper philosophical and scientific argumentation. The exclusion of metaphor from argumentation supposedly gives us a realist system of philosophy and science which takes

as its objective the discovery of natural kinds alleged to be independent of human conceptualization, thereby "cleaving nature at the joints" (in Plato's notorious phrase). However I argue not only is that attempt deeply mistaken in light of the contemporary research within the cognitive sciences on metaphor, but that by analyzing the metaphors that Plato and Aristotle in fact use we can see that metaphor and metaphoric reasoning is itself what makes possible their shared view that metaphor is to be excluded from philosophy and science.

Having shown how Plato's and Aristotle's treatment of metaphor is caught in a strange loop--where some metaphors in their views of philosophy and science are used to argue for the exclusion of metaphor in general from the future practice of science and philosophy--I reject realism about natural kinds in favor of the embodied pragmatism espoused first by Dewey and currently by Lakoff and Johnson. I argue that Dewey provides an alternative metaphysical framework to realism that is crucial for recent work by the neuroscientists Damasio and Edelman on the role of embodiment in the philosophy of cognitive science. I then use that Deweyan framework to both extend and critique Lakoff and Johnson's hypothesis that human reasoning--including scientific and philosophical reasoning--is constituted by embodied conceptual metaphors. I conclude that neither metaphor nor rhetoric are incidental to philosophical and scientific argumentation.

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ACKNOWLEDGMENTS

I wish to thank my advisor, Dr. Mark Johnson, for his patience, understanding and insight as we struggled to bring this project came to fruition. Special thanks are also due the many people who have talked extensively with me about my ideas, including Mark Turner, George Lakoff, Giles Fauconnier, Eve Sweetser, Tom Alexander, Antonio Damasio, Len Talmy, Per Aage Brandt, Nancy Tuana, Scott Pratt, Sarah Douglas, Chris Hundhausen, Nili Mandelblit, Ted Kirkpatrick, Tim Adamson, Greg Johnson, Peter Esser, Don Morse, Juan Ferret, Christopher Preston and many, many others. I was partially supported at the close of the project by a Fulbright research fellowship, and I heartily thank all those who conspired to bring me to Denmark. I also wish to thank my parents for their financial and emotional support over the last seven years.

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INTRODUCTION

My original aim in undertaking this study was to try to explain why so many philosophers, both historic and contemporary, had come to take as foundational two things that seemed so obviously wrong to me. First, I wanted to know why philosophy is so often conceived as dealing only in abstract ideas that are supposed to be purely intellectual and independent of the interactions of our minds, bodies, brains, environments and cultures. In particular how had objective knowledge, as the special product of philosophy and science, come to be something that was identified as universal, disembodied, ahistorical and acultural? My own experiences working with scientists had shown me that knowledge was at best a matter of provisional approximations, to be discarded as soon as something more useful came along. Second, I wanted to know why philosophical argumentation was supposed to be independent of metaphors and metaphoric reasoning when so many of the philosophical theories I had been reading were rife with examples of metaphoric reasoning. How could such an apparently absurd position come to hold so much sway?

The answers I found showed that these two mistakes were not independent of one another. Although I have been thoroughly trained in cognitive science, I set out to explain how these philosophical absurdities by focusing closely on several central classical texts in which they originate and proceeding with a minimum of explicit reference to other recent

work in cognitive science. Such references are only arguments from authority in any case, and they often serve no purpose other than to bludgeon the readers by forcing them to consider mounds of evidence only distantly related to the task at hand. Hence, I chose this combination of treating the classical texts as my evidence and using a recent methodology developed within cognitive semantics as the most aesthetic approach to refuting these philosophical absurdities. The irony of this approach is delicious: What better method is there to refute the position that metaphor and embodiment are irrelevant to philosophical reasoning than to show that some of the most important texts which advocate this position themselves depend on embodied metaphoric reasoning?

However, this story is a long one, and as it may seem pedantic at times some words of guidance to prospective readers of the dissertation are undoubtedly in order. The first three chapters largely concern explaining how things went wrong in the classical conceptions of science and philosophy. Less historically inclined cognitive scientists might do well to only skim them, though the detailed analyses of the metaphor systems may well prove to be of interest to them. The second three chapters consist of my reflections on where we currently are and where we will go from here, and may prove to be of more interest to readers with more contemporary agendas. In these chapters I explore contemporary issues ranging from proposing tasks for neuropsychological research to assessing the importance the sociocultural situatedness of scientific inquiry. The explicit focus on more contemporary philosophy and cognitive science allows me to explain more plainly my theoretical contributions to the current conversation. However, as the details of these later chapters build upon some methods of analyzing metaphors invented in order

to handle difficult philosophical texts, the dissertation should not be seen as a collection of unrelated essays to be read in any order and separate from one another. In sum, I ask the reader to remember that even in moments of high technical dudgeon I am telling a single story about the history and study of metaphoric reasoning, and one which ultimately takes place on a grand philosophical stage.

Summary of the Dissertation

As reading this dissertation is a long journey, both temporally in terms of the historical scope covered and spatially in terms of the quantity of the details covered, a summary of the general argument may prove useful to keep in mind. In general, this dissertation is about the practice of philosophy and the need to challenge the normative view of philosophical inquiry as something that ought to be done in a purely expository form devoid of metaphor and conceived in opposition to embodied knowledge.

I begin by tracing the historical roots of philosophy's normative bias toward the expository rhetorical form. Curiously however, I point out that philosophy in the European tradition first began as a practice which used the rhetorical form of paradox. In the first chapter I show why paradox is a rhetorical form that relies on metaphor and analogy, and how thinking through the metaphors of those paradoxes is crucial to the practice of philosophy even as far back as some of the earliest recorded acts of philosophical inquiry. I argue that what gives these paradoxes their philosophic character is their ability to instigate in us a kind of self-reflexive inquiry about what it is to do

reasoning. I explain how these metaphors serve as a prompt to get the student or hearer to perform certain kinds of conceptual labor. Because these paradoxes depend on metaphors to instigate the philosophical inquiry, I argue that this form of philosophical inquiry is constituted by patterns of metaphoric reasoning.

When in the second chapter I turn to a discussion of one of Plato's dialogues, I show how Socrates establishes a different rhetorical form for philosophy, the *elenchus*, that depends not only on metaphor and analogy but also on *disanalogy*. One of the delights of reading Plato's dialogues is watching Socrates set up his antagonists for a fall; he is normally extremely successful at establishing that his antagonist subscribes to a particular metaphor, drawing out a number of points of analogy, and then finally pointing out how and why the analogy fails. In the *Protagoras* I detail several examples of this process of turning metaphors into analogies and disanalogies, and explain how in the *elenchus* Socrates uses disanalogical metaphoric reasoning to suggest that the fact that the two domains in a metaphor differ means that something can be known in itself, and apart from the distractions of metaphors.

However, I also show Socrates uses this method of turning metaphors into disanalogies to suggest an even more dramatic metaphysical hypothesis about what philosophical inquiry is to do. Socrates argues that the fact that things differ shows us not only that they have their own natures which should be studied in themselves, but that those natures are disembodied "objects" of knowledge. To make this point, I explain in detail how Socrates uses a cluster of related metaphors to draw an elaborate and complex disanalogy between philosophical knowing and embodied seeing. This disanalogy

revolves around the fact that in our ordinary embodied sight, large objects that are farther away can appear to be smaller than the nearby objects that we know to be smaller. As an example of this phenomenon, simply hold your hand for a moment in front of this paper. Socrates argues that the key difference between knowing and seeing is that philosophical knowing entails seeing objects as if it one had already measured the objects. These objects of knowledge are supposed to be objects like those of our ordinary embodied sight, but also unlike them in that these objects are not subject to apparent-size distortions that would result from having a particular bodily perspective from which one ordinarily sees. Such objects of knowledge, conceived as being apart from our bodily experience, are quite literally metaphysical--beyond the world of ordinary seeing and ordinary physics. In this conception of philosophical inquiry as knowing the natures of the things in themselves then, one is supposed to measure an idealized object from an idealized standpoint. Moreover, this idealization is accomplished by overcoming the limitations of our ordinary bodily seeing; I show that Socrates' conception of philosophical inquiry takes place as an attempt to leave behind the body.

Inheriting Plato's and Socrates' arguments about the importance of studying things in themselves, Aristotle argues that all future philosophical and scientific inquiry should be done in the rhetorical form of exposition. As a crucial part of his normative conception of philosophical exposition, Aristotle explicitly argues that analogies and metaphors should not be permitted in any philosophical or scientific argumentation that is intended to lead to genuine knowledge. The reason is that metaphors can be misleading, as Socrates and Plato showed by using metaphors in order to establish the grounds for disanalogy.

However, Aristotle takes this argument a step further by arguing that metaphoric reasoning in general must be left behind. It is to be replaced by causal and logical reasoning about the natures of things--which he calls natural kinds--and philosophical and scientific argumentation is to be pure exposition of the relationships which hold among these natural kinds. Overall I argue that the net result, for both Aristotle and the classical view of knowledge generally, is a mistaken metaphysical and epistemological picture that yields both a false dichotomy between metaphor and knowledge and a false conceptualization of knowing agents as disembodied.

Much as I have done for Socrates and Plato, I show how Aristotle's arguments for the exclusion of metaphors from philosophy and science in fact themselves depend on analogies and metaphors. In particular I will trace out his argument for natural kinds and show how it rests on metaphoric reasoning. When I complete this argument, I show how Aristotle--like Plato and Socrates before him--is caught in a strange loop; he uses metaphor to establish a theory of natural kinds which he then uses to exclude metaphor. All three of these thinkers use metaphor in their own philosophy to suggest that metaphor should be prohibited from philosophical inquiry. Allow me to be blunt: this is madness and hypocrisy. Thus in the first part of the dissertation I conclude that, despite the best attempts of these three classical thinkers to require us to leave metaphors behind, none of these thinkers can accomplish the feat.

The failure of this first journey inspires a second. In the second half of the dissertation, I argue that the epistemological separation of philosophy and knowledge from metaphor and analogy is a mistake because metaphors are constitutive of

philosophical inquiry and scientific theorizing. This points to a radical need to reconceptualize the metaphysics which made this false dichotomy possible. I identify two particular points that I argue must be rethought: the metaphors of the classical metaphysics of knowledge and the way in which that metaphysics constructs the agent of knowing as disembodied.

In chapter four, I use the American pragmatist John Dewey as a starting point for addressing these two problems: First, I argue that in his metaphysical framework he reconnects metaphor and knowledge as "being as;" and second, I argue that Dewey offers different metaphors for framing philosophical practice which take into account the embodiment of the knower. As I am particularly interested in the lessons I can draw from Dewey to apply to rethinking problems in cognitive science, I explain how Dewey's theory of the pragmatic and evolutionary situatedness of knowledge in the organism-environment relationship (or what Dewey calls "the live creature") meshes with recent work on the embodiment of reason by Antonio Damasio and Gerald Edelman (among others). I am careful to point out however, that Dewey realizes that the knowledge produced by such sciences is an account from a particular perspective and which uses particular metaphors in shaping that theory. Theories are thus culturally as well as naturally embodied; this is part of what I call Dewey's metaphysics of "being as." I conclude from my discussion of Dewey that the practice of philosophical and scientific inquiry needs to be reconceived as a process that is self-aware of its reliance on metaphoric reasoning..

In chapter five, I cash out this metaphysical picture within my own small corner of expertise in cognitive science. I show how Dewey's metaphysics and his theory of

embodied knowledge have contemporary currency by providing a framework within which some recent controversies in cognitive science stemming from Lakoff and Johnson's "embodiment hypothesis" on metaphor can be profitably resolved. I use Dewey to develop my own theoretical framework for the embodiment hypothesis in order to help cognitive scientists working on metaphoric reasoning distinguish between two projects. These two projects are: first, the projects of finding the embodied neurobiological processes of conceptual metaphors and other related closely related phenomena (such as image schemata, conceptual blends, etc.); and second, the projects that show the inherently metaphoric character of some field of theoretical inquiry (such as Aristotle's philosophy, the cognitive neuroscience of attention, or even theories in cognitive science about the embodied basis of metaphor). I argue that Dewey provides us with a way to understand how these two projects are interrelated, and I argue for an expanded notion of the embodiment hypothesis which includes both the sociocultural and physiological research projects.

While I am not shy about criticizing what I see as the weak points of this research into the embodied and metaphoric character of cognition, I argue in my conclusion that its most successful recent work can provide philosophical inquiry with a worthy alternative to the expository form. I conclude the dissertation, then, by offering an alternative rhetorical form for the practice of philosophy that maintains the connections between metaphor, embodiment and knowledge. The rhetorical form I suggest coheres around a metaphor of the philosopher as physician, where a "patient-centered" approach uses a case study method to keep philosophical inquiry pragmatic, situated, and embodied.

CHAPTER I

THE PARADOX OF PHILOSOPHY AND RHETORIC

Philosophy as Paradox

Paradoxes vex us. They call out for resolution and entice us into further consideration. For what is a paradox? Two claims, one doctrinal and the other against that doctrine, each seemingly opposed yet each seemingly true. They are an elusive quarry, hiding their resolution behind a deceptive facade of contradiction. We puzzle at them, driven by a sense that they are not quite contradictory by virtue of their truth. And yet, when we work through a paradox, it is not that we resolve it into a single claim--we simply understand what motivates the paradox. Presenting others with a paradox, as the Presocratic philosophers Heraclitus and Gorgias do, is not to take refuge from clarity of literal exposition and logical consistency. Rather, it is in an important sense the best a philosopher can do--for if we are to retrace the steps of that philosopher, we must do so by repeating the thought experiments that the philosopher's paradoxes lay out for us. Understanding how philosophy is shaped in its beginnings by the rhetorical form of paradox will prove crucial to understanding why later philosophers attempt to distance philosophy from metaphor and to exile metaphor to the rhetoricians.

In this first chapter I will be arguing that posing paradoxes invites our attention to a kind of thinking poorly suited to purely expository prose. I claim that Heraclitus and Gorgias accomplish this feat by using the paradoxical form as a prompt which engenders certain patterns of thinking, and the cognitive mechanisms which produce these patterns of thinking are metaphoric mechanisms. I will begin by showing how metaphor is essential to understanding the philosophical thinking in Heraclitus' cryptic apothegms, specifically in those apothegms which characterize Heraclitus' conception of *logos* (reason). Yet once one perceives the power of metaphor to guide philosophical reasoning, it raises the question of whether metaphor's role in argumentation is without limit. This is precisely the question that Gorgias' rhetorical paradoxes raise, as when he sets out a paradoxical argument to prove the absurd statement "nothing exists." I conclude that this consideration of Heraclitus and Gorgias as examples of thinkers who teach through paradoxes provides some initial insights into how metaphorical reasoning can be constitutive of philosophical inquiry.

A very brief overview of the role of this chapter in the dissertation as a whole may prove helpful in setting the overall scene. In the following two chapters, I will be arguing that the metaphors these Presocratic thinkers used in their paradoxes provided much of the impetus first to Socrates' and Plato's highly critical stances toward metaphoric reasoning and then subsequently to Aristotle's explicit injunction against the use of metaphoric reasoning in philosophy. However, in the first half of the dissertation considered as whole, I will be showing that none of these thinkers can do philosophy without using metaphors, even when they attempt to exclude metaphor from philosophical inquiry. I will show how

those misguided attempts to exclude metaphor from philosophy led to a profoundly mistaken metaphysical framework.

Then, in the second half of the dissertation, I will explore the consequences of explicitly taking the contrary position that metaphors are constitutive of philosophical inquiry. Therein I will first propose an alternative metaphysical framework to remedy the shortcomings of the classical one, and then show in detail how a revised metaphysical picture which regards thinking as fundamentally metaphoric can frame recent work in cognitive science in multiple useful and provocative ways. For example, in order to show how this philosophical contribution leads to a better overall framework for recent research on metaphor in cognitive science, I will distinguish between the role of metaphor in shaping theorization and the particular ways in which cognitive science has investigated the role of metaphor in human conceptualization at multiple levels of investigation (including the phenomenological, cultural, linguistic, psychological and neural levels). Finally, in the concluding chapter, I will return again to the point I will raise in this first chapter. As we do philosophical inquiry, particularly the philosophy of cognitive science, we need to be critically aware of how the metaphors and rhetorical forms we use tie together all of these many levels of the investigation of cognition. I will conclude by explaining how contemporary cognitive science presents us with a better rhetorical model and better metaphors for philosophical inquiry.

Philosophy, Metaphor, and the Embodiment Hypothesis

For many professional philosophers, about the only place metaphor might be acknowledged as playing an important role in philosophical thought is in Presocratic philosophy. In the standard accounts of the emergence of philosophy from myth,[1] commentators have asserted that the Greek lexicon was not sufficiently developed at this early stage for the Presocratic philosophers to express their thoughts literally, and so reliance on metaphor was a necessity for those thinkers who were beginning to articulate what would later become philosophy. On their view, metaphor is not really admissible in philosophical debate but is more properly a tool of the poets. They hold that since philosophy in its earliest beginnings had no recourse to a form of speaking it could properly call its own, the earliest philosophers (or proto-philosophers) were forced to use metaphors and other devices thought to be appropriate to poetic forms of speech. Thus (the usual story goes) many Presocratic philosophers answered the original philosophical question "What is Being?" with metaphorical responses drawn from their ordinary experiences such as water, air, fire, and so on. On this view, part of what marks Western philosophy as *philosophy* is that in its development from its earliest times through Socrates, Plato and Aristotle, philosophy at first outgrows and then leaves behind the use of metaphor, as a snake sheds its skin. For them, metaphor is an antiquated way of

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[1] One finds this account in virtually the entire corpus of the Anglo-American and German accounts. For an example see G. S. Kirk, J. E. Raven, and M. Schofield, *The Presocratic Philosophers*, 2nd ed. rev. (New York: Cambridge University Press, 1983), pp.72-74.

speaking, admissible only when philosophy still had a certain mythic vagueness about it and when philosophy still lacked a certain kind of argumentative precision.

In this dissertation I aim to turn that view on its head. Though perhaps fewer and fewer contemporary philosophers explicitly hold that philosophical metaphors are quaint anachronisms from our pre-philosophical past, the depth of conviction with which the conventional view of metaphor as inadmissible in philosophical arguments is still held is revealed by the relatively slow acceptance of contemporary research showing that metaphor is a matter of thought and reason. The difficulty here is that the contemporary theory of metaphor challenges some of the most fundamental assumptions about what philosophy is. Those assumptions hinge on a distinction between philosophy and *mere* rhetoric. This distinction has its beginnings in the origins of Western philosophy in Greece at the time of the Sophists, is dramatized and concretized by Socrates as he appears in Plato's dialogues, and was rigidly fixed by Aristotle. This traditional view excludes metaphor from philosophy. It regards philosophy as an attempt to expose, discover and articulate the literal truth through expository argumentation, while rhetoric is the attempt to use poetic metaphors to assimilate the audience to the position the rhetor already holds.

On the traditional view metaphor is a linguistic device which makes *improper*, though perhaps appealing, comparisons between matters better considered on their own merits; as such, metaphor is an abuse of language and linguistic force to persuade the listeners to share the same conclusions as the rhetor. However, if metaphor is essential to much of our abstract conceptualization and reasoning rather than being a mere impropriety of poetic language and rhetorical speechmaking, then metaphor is not something

philosophy can exclude but is instead integral to philosophical practice. The crucial question concerning philosophical metaphors is then not "How can we exclude metaphors from philosophy?" but instead "Which metaphors are we to use in defining and practicing philosophy?"

That metaphor structures our abstract conceptualization and reasoning is the central finding of a growing body of work within contemporary cognitive science called cognitive semantics.[2] Beginning in 1980[3] with a mass of linguistic evidence, the linguist George Lakoff and philosopher Mark Johnson argued that much of our everyday language is systematically shaped by a relatively small number of conceptual metaphors. They showed that metaphors structure our reasoning about many basic concepts such as causation, time, mind, ideas, knowledge, the emotions and more. They further argued that many literary metaphors (the novel and poetic expressions which are traditionally recognized as metaphors) are creative extensions of basic conceptual metaphors, and later work by Lakoff and the rhetorician Mark Turner on literary uses of metaphor developed this point.[4] But most importantly their evidence showed that a small number of source

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[2] See George Lakoff, *Women, Fire and Dangerous Things: What Categories Reveal About the Mind* (Chicago: University of Chicago Press, 1987), Mark Johnson, *The Body in the Mind: The Bodily Basis of Meaning, Imagination and Reason* (Chicago: University of Chicago Press, 1987), George Lakoff, "The Contemporary Theory of Metaphor" in *Metaphor and Thought* 2nd ed. rev., ed. by Andrew Ortony (New York: Cambridge University Press, 1993, pp. 202-251), Mark Turner, *The Literary Mind* (New York: Oxford University Press, 1996), Raymond Gibbs, *The Poetics of Mind: Figurative Thought, Language, and Understanding* (New York: Cambridge University Press, 1994), Eve Sweetser, *From Etymology to Pragmatics: Metaphorical and Cultural Aspects of Semantic Structure* (New York: Cambridge University Press, 1990).

[3] George Lakoff and Mark Johnson, *Metaphors We Live By* (Chicago: University of Chicago Press, 1980).

[4] George Lakoff and Mark Turner, *More than Cool Reason: A Field Guide to Poetic Metaphor* (Chicago: University of Chicago Press, 1990).

domains recurred in the conceptual metaphors, providing rich sources of structure for reasoning about a wide range of possible targets. They noticed that these recurrent source domains had to do with the body, and they suggested that metaphor exhibits a directionality in which abstract domains are understood via conceptual structure and reasoning patterns drawn from bodily perception, spatial movement, and object manipulation. This directionality was one of the main reasons which led them to articulate a general theory of cognition and thought called *the embodiment hypothesis*.[5]

The embodiment hypothesis argues from a considerable number of different kinds of evidence that human concepts and patterns of reasoning are grounded in our bodily experiences. As Johnson puts it, the body is *in* the mind. These patterns of bodily feeling are known as *image schemata*. They are patterns that recur in our everyday bodily experience--experiences of containers, balance, movement, and so on. Preconceptual bodily patterns structure our understanding and conceptual systems, and define the "logic" of a relatively small number of source domains. These image schemata guide projections from these source domains into new target domains of experience, and the inferential patterns of the target domain are shaped by the logic of the bodily patterns of the source domain. This mechanism of projection is called *conceptual metaphor*, or more simply, metaphor. Metaphor is a means of transferring our experiential knowledge of one domain to another domain. As such, it is a matter of thought and reasoning, and not of language alone. Metaphors may have expressions or manifestations in our use of language, but they

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[5] See Johnson's *The Body in the Mind* and Lakoff's *Women, Fire and Dangerous Things*.

are not a matter of mere words. They are patterns of thought and inference.

The embodiment hypothesis is what turns the conventional view about the role of metaphor in philosophy on its head. Of course the Presocratic philosophers used metaphors, not because they were forced to resort to metaphor, but because all philosophers necessarily use metaphors. If our abstract thinking is always reliant on bodily metaphors, then the Presocratic philosophy was not radically different from our own contemporary philosophy in its use of metaphors to convey abstract thoughts. The question is not how to avoid metaphors, but which ones to use. On my view the writings of the Presocratics are thus not pre-philosophical, but profoundly philosophical debates about what philosophy is to be and how best to employ such metaphors. Rather than the awkward, vague and metaphorical fumblings of absolute beginners, the Presocratics' peculiar answers to the question "What is Being?" constitute a horse race of metaphors, with each philosopher jockeying for a prime position in defining how philosophy is to be done and what philosophy is to be about.

In this first chapter I use the embodiment hypothesis to begin to trace the origin of the distinction between philosophy and rhetoric in the metaphors. I begin by considering the content of the form in which philosophy is to be done. By the odd turn of phrase "the content of the form" I simply mean the ways in which rhetorical form contributes to the philosophical content. In particular, I will argue that the Presocratic philosophers used the rhetorical form of paradox to convey a substantive philosophical point about what philosophical inquiry is. This argument requires seeing that the Presocratic philosophical paradoxes are constituted by conceptual metaphors. By the phrase "constituted by

conceptual metaphors" I mean to show why and how these paradoxes generate intellectual conflict for the hearers that instigates a process of thinking through the metaphors of the paradoxes. The conflict prompts the hearers to do philosophical work for themselves. Further, I will argue that what makes the intellectual conflict shaped by these philosophical metaphors intelligible to the hearers is that they are "embodied;" that is, these paradoxes are successful because the metaphors used draw on relatively basic and shared patterns of reasoning grounded in the bodily activities of human beings. Thus I argue that the use of the rhetorical form of the paradox conveys the important point that philosophical inquiry is essentially a process of thinking on the hearer's part, and not merely a record of what some philosopher other than the hearer has thought. Bodily metaphors are the key cognitive tools that the paradoxes use to instigate this process of thinking, and in this fashion the bodily metaphors constitute the philosophical thinking provoked by these paradoxes.

An understanding of how European philosophy is shaped in its beginnings by the Presocratics' choice of the rhetorical form of paradox is crucial for understanding why later philosophers like Plato and Aristotle will attempt to distance philosophy from metaphor and to exile metaphor to the rhetoricians. On this later view the Presocratic use of paradoxes constituted by metaphoric reasoning will be seen as evidence that metaphoric language is underspecified and ambiguous; and, as a consequence, both metaphor and paradox should be excluded from philosophy in favor of more directly referential and literal speech used in the rhetorical form of exposition. However, I will show in later chapters that the reasoning behind the exclusion of metaphor is itself constituted by

conceptual metaphors. This will require extending the claim that philosophical thinking is constituted by metaphor from philosophy done in the rhetorical form of paradoxes to philosophy done in the rhetorical form of exposition. In order to show how metaphor is "constitutive" in both of these instances, in later chapters I will be returning to and elaborating upon the conception of metaphoric reasoning I will now present.

The Question of Rhetorical Form: Must Heraclitus Write in Paradox?

Heraclitus is renowned for having bequeathed to us a collection[6] of short fragments which are memorable, cryptic and paradoxical apothegms. When we encounter Heraclitus, the obvious question that leaps to most twentieth century minds is: Why did Heraclitus choose to write philosophy in the form of paradoxes? Yet before tackling this question it is necessary to investigate whether or not it was possible to choose to write in

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[6] There is a long dispute of distinguished philosophical pedigree over whether or not Heraclitus wrote a continuous narrative or intended each (or some grouping thereof) the fragments to stand alone as oral apothegms. Among the more memorable passages, in his *Early Greek Philosophy* (London: A. and C. Black, 1892) John Burnet sniped at Diels, the scholar responsible for the first standard compilation of Presocratic fragments: "In his edition, Diels has given up all attempt to arrange the fragments according to subject ... I think that he overestimates the difficulty of an approximate arrangement, and makes too much of the view that the style of Herakleitos was 'aphoristic.' That is was so, is an important and valuable remark; but it does not follow that Herakleitos wrote like Nietzsche. For a Greek, however prophetic, there must always be some distinction between an aphoristic and an incoherent style," p. 132, fn. 5. This debate is still alive and fertile, and a more recent reconstruction of how such a continuous narrative might have appeared can be found in Charles H. Kahn, *Art and Thought of Heraclitus* (New York: Cambridge University Press, 1979), pp. 3-9. For opposing views see also Kirk, Raven and Schofield in *Presocratic Philosophy*, pp. 437-38 and W. K. C. Guthrie in *A History of Greek Philosophy*, 6 vols. (New York: Cambridge University Press, 1962-81), 1: 183-86, who has an excellent summary of the ancient testimony to Heraclitus' obscurity. My own view is that the matter of whether the fragments belong to a single narrative whole is probably undecidable, but it is clear to me that whatever the overall superstructure of his work might have been Heraclitus made profound use of extraordinary and oracular (and not ordinary and prosaic) language.

a rhetorical form other than a paradoxical or poetic form. For sundry reasons, some recent scholars writing on the Presocratics have objected that it was impossible for Heraclitus to choose to write in the rhetorical form of paradoxes. I will oppose their view on cognitive grounds, but as they claim that their arguments--if they were to be successful--would preempt my arguments concerning the importance of the choice of rhetorical form to philosophical inquiry, it is necessary to contest them briefly before I begin my analysis of Heraclitus.

In his discussion of Heraclitus and Parmenides, Ortega y Gasset suggests that at the time Heraclitus wrote there was no manner of speaking which could adequately convey his thoughts. Although prose had appeared in Hecateus' books on geography and history in the half-century preceding Heraclitus,

> it was prose that was still inadequate for expounding the strange transcendental thought that was to be philosophy. Thus Heraclitus *could not* write a continuous text book. He expressed his ideas in spurts, in brief pronouncements, which in their attempt each time to be total statements were stylistically "compressed" and a sort of doctrinal dynamite.[7]

Ortega y Gasset continues by suggesting that although there still is no adequate genre in which to express philosophical thought, prose has certainly developed to the point where some expression of philosophic ideas is possible. The point is that the choice of genre--poetic paradox--was not a choice at all for Heraclitus, but a necessity forced upon him by

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[7] Ortega y Gassett, *The Origins of Philosophy*, trans. by Tony Talbot (New York: W. W. Norton and Company, 1967), pp. 85-86.

a poverty of language.[8] The genres have not yet been carved out by Aristotle and other later thinkers, and so poetry and paradox are the only literary genres (or rhetorical forms) available to Heraclitus and the other early Presocratics. In defending what he calls Heraclitus' use of paradox and parable, Guthrie makes the same kind of argument:

> The teaching of Heraclitus was not something indescribable in literal terms like the religious message of Jesus; but it was something which could at no time be easy to express, and in his own day was so novel as to outrun the resources of contemporary language.[9]

Again the point is straightforward: In order for there to be a choice, there must be options to choose from; and speaking about abstract philosophical issues in expository prose was not yet an option at the time Heraclitus wrote.

The key point in this argument is that Heraclitus' meaning is supposed to be independent of the particular words and rhetorical form in which he expressed it, and he only resorted to paradoxical expression because the Greek language was not yet sophisticated enough for him to be able to write whatever he meant. This view, which dates from the earliest ancient philosophical histories of Aristotle and the Peripatetics, suggests that later and less primitive Greeks will have a sufficiently developed language in which it is possible to speak adequately about philosophy. According to it, later philosophers will refine a set of terms in which philosophical discussion may properly take place and will fix the meaning of the abstractions to the point where clear expository

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[8] The inadequacy Ortega y Gassett (*Origins of Philosophy*) sees in 6th century BCE Greek is not merely that it lacked a sophisticated philosophical vocabulary, but that at that time expository prose was not yet seen to be literature. See fn. 7 on p. 87.

[9] Guthrie, *History of Greek Philosophy* 1: 439. See also the argument given at 1: 413.

expression will become possible. Though philosophical exposition was perhaps not possible at the beginning, it is possible in hindsight. Guthrie's sympathetic defense of Heraclitus' use of paradox is an example of this kind of distortion, for Guthrie argues that Heraclitus' message could now be re-described in literal language, although at that time it was supposedly impossible--and therefore not a choice--for Heraclitus to do so. On this view Heraclitus may not have done philosophy as it should properly be done, but any deficiency is due to mere historical contingency.

An obvious difficulty with this kind of apologetics for Heraclitus' use of language which Heidegger[10] and much other recent scholarship[11] exposes is that to think of the Presocratics as primitive thinkers who are simply less sophisticated versions of contemporary practitioners of philosophy as exposition is a misleading mistake. For example, in giving his history of the Presocratics, Aristotle perpetually frames their thoughts in his own terms, distorting his predecessors as thinkers who grasped mere parts of the philosophical system that only he was the first to see as a whole. Heidegger argues that this difficulty reveals that hindsight is no advantage in understanding the Presocratics,

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[10] Martin Heidegger, *Early Greek Thinking*, trans. by David Farell Krell and Frank A. Capuzzi, (New York: Harper & Row, 1975). Heidegger points out this problem for a number of different Presocratic thinkers. For an example, see his attempts to recast traditional thinking in "The Anaximander Fragment" in *Early Greek Thinking*, pp. 13-22. He argues that Anaximander's thinking "is anything but a kind of primitive and anthromorphic representation" (p. 22). For his arguments concerning Heraclitus, see also the essay entitled "Logos" in the same volume.

[11] I have in mind the tendency to rely on Aristotle's account of Presocratic philosophy in the Metaphysics, especially his characterization of these early thinkers as seeking after an *arche*, or principle of reason. For an example see Kahn in *Art and Thought in Heraclitus* when he argues that "the doctrine itself is seen from a perspective far removed from the intellectual atmosphere of the early fifth century ... For Aristotle Heraclitus was a material monist who derived the entire physical world from fire" (p. 4).

but rather a handicap. What we ought to do instead is to think, as much as we are able to do this, from the perspective of the Presocratics. We may mitigate the problem of thinking from a later time by identifying and demarcating our own biases, particularly our bias to expect philosophical language to be expository.[12] Historically speaking it is absurd to think that, simply because later philosophers have a normative bias toward exposition in philosophy, a sixth century BCE philosopher like Heraclitus could have set out to challenge, deviate from, or be in any way governed by those chronologically subsequent norms. Heidegger thus concludes that what is for us the question of rhetorical form was thus not even yet a question in Heraclitus' time. Hence, although Heidegger wants to resist seeing the Presocratics' as primitive thinkers who share the same projects and concerns of later philosophers, he still maintains that it remains historically impossible for Heraclitus to choose to write in one rhetorical form or another.

Though there are a couple of limited truths which lend an initial plausibility to the foregoing hypothesis that a choice of rhetorical form was impossible for Heraclitus, I think that there are good empirical and cognitive grounds for extending to Heraclitus a significant capability to *choose* his rhetorical form. Before proceeding, however, I should acknowledge two facts that appear to lend plausibility to this mistaken hypothesis. First, as a matter of historical fact, the rhetorical forms were catalogued and defined by Aristotle and his contemporaries. Second, we know from our ordinary experience that languages do change and that experts do invent technical vocabularies which make it possible to

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[12] Heidegger (*Early Greek Thinking*, pp. 19-22) speaks of entering into a dialogue with the Greek texts.

speak with greater precision about matters which were once much less understood. These two facts are what motivate the two lines of argument I have just described.

Yet when considered from both an empirical and a cognitive standpoint, the connection between these facts and it supposedly being impossible to "choose" to write philosophy in the form of paradoxes rather than in more literal speech at that moment in history turns out to be highly dubious. The fact that the rhetorical forms as we have come to know them had not yet received a formal definition does not imply that it was impossible to speak in Heraclitean times in more metaphorical or more literal Greek. In particular, the oracle at Delphi was renowned for providing puzzling and obscure statements similar to those that Heralitus makes. Uvo Hölscher argues that

> Generally speaking, it is the obscurity of the language that recalls the oracular. In most oracles something is hinted at, and the hinting takes the form of metaphor.... That an oracle is intrinsically a saying to be interpreted was something that the Greeks were fully aware of. One aspect of the contrast between the barbarian Croesus and his Greek guest Solon is that Croesus is inclined to take an oracle in its initial and trivial meaning.[13]

In making this point, Hölscher cites evidence of the occurrence and interpretation of oracular speech using metaphors from as early as (roughly) the ninth century BCE (Homer's Odyssey) and the eighth century BCE in the oracle's pronouncement about Hesiod's place of death, as well as evidence from the near-contemporaries of Heraclitus (late sixth century BCE) such as Herodotus (early fifth century BCE). As Hölscher points

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[13] Uvo Hölscher, "Paradox, Simile, and Gnomic Utterance in Heraclitus", in Mourelatos, *The Presocratics: A Collection of Critical Essays* (Garden City, NY: Anchor Press/Doubleday, 1974), pp. 229-30. Hölscher's makes an analogous overall argument to mine in claiming that Heraclitus' use of paradox is an implicit simile for his method. My argument is found in the subsequent section.

out both the oracular tradition and the need to find an interpretation of the oracle is found throughout the early Greek literature. The empirical fact that the Greeks were well aware of the need for the oracle to be interpreted shows that they understood the contrast between the more metaphorical and the more literal modes of speech, regardless of the absence of the established rhetorical forms. Clearly then, Heraclitus could choose (as he apparently did) to model his philosophical writings on oracular language, and he could have also chosen to give interpretations or explanations in more ordinary language (though he apparently did not).

Nor does it follow from the second fact--that linguistic change does occur as experts create technical vocabularies--that it is impossible to do abstract philosophical thinking before a refined, non-metaphorical and expository abstract technical vocabulary exists. If the embodiment hypothesis is generally correct--a point which I intend to support over the first half of the dissertation using evidence not only from Heraclitus but also many other philosophers--then our more refined and abstract vocabularies, such as our technical philosophical vocabulary, remain dependent on bodily metaphors as their sources. These bodily metaphors can be used either in the service of exposition or they can be stylistically compressed into the kind of paradoxical apothegms characteristic of the Heraclitean fragments. However, as my discussion of the Heraclitean and Gorgian paradoxes will show, it is emphatically not the case that abstract philosophy is something that can only be done in a restricted technical vocabulary.

Instead of drawing a sharp distinction between the use of metaphorical language and the paradoxical rhetorical form on one hand and the use of literal language and the

expository form on the other hand, I am going to maintain that there is a continuum between more and less metaphorical which is native to human cognition. Much of the time we think using conceptual metaphors, and the conceptual structure reflected in language is one kind of evidence of those conceptual metaphors. For example, no one would claim that the Greek language of Heraclitean times did not have words to describe seeing and hearing, nor would anyone claim that the usage of those terms was not well established within their domains of sight and hearing. The usage of those terms in these more ordinary domains was more expository and more literal and less poetic and less metaphorical. But as the linguist Eve Sweetser has shown for Indo-European languages generally, and including Greek, a historical succession of terms for seeing and hearing have been repeatedly pressed into service to as terms for knowing. Thus a tradition of metaphorical usage of seeing and hearing terms as bases for speaking about subjects like knowing was well established before Heraclitus wrote.[14]

Even here, at the time of its genesis in ancient Greece, I will be showing that the terminology of philosophical reasoning is already constituted and shaped by metaphors drawn from the body. Further, it is also important to see that these metaphors and paradoxes are not merely a matter of poetic *language* but of poetic *thinking*.[15] On my view, metaphor is thus a matter of thinking and not merely of language. Hence I will be

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[14] Sweetser, *From Etymology to Pragmatics*, p. 23-48.

[15] To do so would be tantamount to suggesting there was a time at which everyone spoke poetically all the time, which is absurd. But if metaphor is a matter of thinking and not language, then poetic thinking simply refers to the capacity to think rather more creatively some of the time.

arguing that there is a continuum between, on one hand, the more literal and the less metaphorical mode of speech and, on the other hand, the less literal and the more metaphorical mode of speech. Given Hölscher's parallel arguments on the Greek facility with the distinction between metaphoric and oracular speech and the more interpretative and ordinary speech, I think that it is entirely reasonable to presume that metaphoric thinking is a feature of human cognition that would be as readily available to Heraclitus as it is to us. I will give further empirical evidence for how metaphoric reasoning shapes Heraclitus' paradoxes as I discuss them in detail in the next section of this chapter.

To sum up the point of this section: On my view the necessary cognitive resources were present for Heraclitus to choose to write more paradoxically and more metaphorically as opposed to less so, even at this relatively early point in Greek civilization. It was not the lack of an adequate philosophical vocabulary that compelled Heraclitus to write in the form of paradoxes. Instead Heraclitus' carefully composed paradoxes are deliberately composed, stylistically compressed apothegms which require cognitive mechanisms like conceptual metaphors to work. Nor does the lack of precisely defined rhetorical forms imply that it was impossible to choose to write in more, rather than less, paradoxical statements. Finally, the first philosophical thoughts were not so unique and novel that their very uniqueness forced Heraclitus to speak in radically new poetic metaphors. Instead, the embodiment hypothesis suggests that we should expect philosophy, like other kinds of abstract thought, to be built up via metaphor out of a relatively small number of source domains. Again, the evidence I will discuss in the following section will show how this hypothesis bears out; Heraclitus' fragments are

riddled with the same bodily metaphors for thinking which can be found elsewhere. Heraclitus' use of metaphor and his choice of the paradoxical form is as ordinary as it is extraordinary: It is ordinary in that it is a perfectly normal manner of thinking to extend the terminology of the body in an extraordinary way to conceptualize and speak about an abstract subject.

Heraclitus' Paradox: To the Bounds of *Logos*

I return to my original question. Why write in a paradoxical rhetorical form then? Paradoxes intrigue us: they boldly capture our imagination and cause us to work out the philosopher's thoughts. The greater challenge requires the greater detail and care in working through the problem, and so serves to assuage the philosopher's greatest fear--being misunderstood. Far from it being that fifth century BCE Greek prose was inadequate to the task of philosophic expression, Heraclitus may well have chosen to write in paradox precisely because he saw that philosophy--I mean the term here not as designating a field, but in the more mundane sense of thinking wisely--is not a subject well taught in exposition. While our tradition, overly influenced by Aristotle, tends to think of the Presocratics as solely engaged in metaphysics, they were also--and perhaps first and primarily--teachers (*sophistes*).

Paradoxes also make deep distinctions--both between those who can resolve them and those who cannot; and between ourselves before we can resolve them and ourselves after we have resolved them. The feeling of having resolved a paradox is akin to the

feeling of having answered a riddle--in either case, a puzzle has fit together. Further, we are left with a feeling of accomplishment, perhaps even of smugness, at solving the puzzle. Why? Because not everyone could have resolved the paradox, and we know this because we can clearly remember not being able to resolve it ourselves. And in fact if it is true paradox (and not merely a puzzle) we may well not be able to re-solve it again, at least not without effort.

I want to consider just one of Heraclitus' many paradoxical themes. That is the character of the *logos* (reason), which Heraclitus simultaneously asserts is common to all humankind and ignored by most of us. Reading Heraclitus' fragments on reason, it is easy to condemn him three times over as merely hopelessly obscure, undeniably aristocratic and possibly misanthropic. Such a condemnation would be foolish, however. Instead, in his penchant for the obscure Heraclitus may have been making a very deep metaphysical point about the character of reason. Consider the fragments from his book:

> The *logos* is as here explained; but men are always incapable of understanding it, both before they hear it and when they have heard it for the first time. For though all things come into being in accordance with this *logos*, men seem as though they had never met with it, when they meet with words and actions such as I expound, separating each thing according to its nature and explaining how it is made. As for the rest of mankind, they are unaware of what they are doing after they wake, just as they forget what they did while asleep ... Therefore one must follow that which is common. But although the *logos* is universal, the majority live as if they had understanding peculiar to themselves.[16]

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[16] Based on the translation in Kathleen Freeman, *Ancilla to the Presocratic Philosophers* (Cambridge, MA: Harvard University Press, 1967), p. 24. I have removed her parentheticals in these fragments, and restored the word Logos to the spots where she translated the word as Law.

In these two fragments the sense in which reasoning is something elitist and separatist should be apparent. There is a clear distinction drawn between the few humans who can understand the *logos* and the majority who cannot, but "live as if they had understanding peculiar to themselves." Throughout the fragments, Heraclitus appears to be vain, arrogant, haughty and prideful, scoffing at those who dismiss his pronouncements as unequal to himself; they are mentally asleep even while physically awake, while only Heraclitus and those few who can understand the strange riddles he utters are fully awake. He uses the contrast between the bodily conditions of being awake and being asleep as a metaphor for the difference between those who reason and those who do not.[17] Yet from the outset of his book he suggests why his thought is challenging and paradoxical. It is the *logos*, not Heraclitus, that is difficult to follow. If Heraclitus appears to look down at commoners, it is because reason frequently leads one to argue against commonly held opinions. In another fragment he makes this point explicitly "When you have listened, not to me but to the *logos*, it is wise to agree that all things are one."[18] We are not to listen to Heraclitus, but to the *logos* in what he says.

But why should anyone listen to the *logos* in an obscure riddler's paradoxes? Why does he not try to speak about it less enigmatically? Another of Heraclitus' cryptic

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[17] Heraclitus' use of the awake-asleep metaphor in respect to the cognitive activity of people is quite similar to its use in buddhist doctrine with respect to spiritual activity, where *budd* is the Sanskrit root for to awaken and the *ha* is the past participle; hence, *buddha* means to have awakened, and a *buddha* is considered to be a person who is fully awake in the spiritual sense, and hence more compassionate and spiritually more perfect than her fellows.

[18] Freeman, *Ancilla*, pp. 24-25.

fragments is that "Nature loves to hide."[19] By the act of posing paradox after paradox in his book, perhaps Heraclitus is making a deep point about the character of reason. Perhaps the *logos* only shows itself to us as we do the *thinking* necessary to working through paradoxes. Such a reading of his view of the *logos* in general would make sense of his fragment on nature loving to hide, insofar as paradoxes, like nature, also hide their resolutions from us before we work them out. If the nature of things is to hide from *logos*, then teaching others to reason would necessitate presenting them with paradoxes, for paradoxes prompt us to think in the appropriate manner. If we see that the process of coming to know the *logos* as itself a paradoxical act, then Heraclitus' choice to write in a paradoxical form is motivated by a desire to instigate that same activity on the part of his hearers. In short, my suggestion is that Heraclitus is arguing by example that the activity required to work through a *specific* paradox is itself the very thinking process of philosophy in *general*.

In a moment I will give another example from Heraclitus' fragments which lends additional support to this thesis, but first we might note that this process of making a more general pronouncement by means of a somewhat cryptic specific statement is a common feature in proverbial and oracular speech. Working from a number of examples of proverbs, George Lakoff and Mark Turner[20] argue that human reasoning about proverbs is deeply structured by a conceptual metaphor that they call the Generic Is Specific

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[19] Freeman, *Ancilla*, p. 33.

[20] Lakoff and Turner discuss this metonymy in *More than Cool Reason*, pp. 160-166.

metonymy.[21] The Generic Is Specific metonymy suggests that we metaphorically understand a specific situation to stand for a general class of situations. Further, the structure of the specific situation is imparted to how we understand the general class of situations. What I have shown about Heraclitus' use of paradox so far is an example of precisely this kind of process; the specific act of thinking through a paradox stands for the general act of thinking for philosophy.

Take another fragment of Heraclitus for an example of how something quite like the Generic Is Specific metonymy is integral to the process of working out Heraclitus' paradoxes:

> Not understanding, though they have heard, they are like the deaf. The proverb bears witness to them: "Present yet absent."[22]

What might the specific situation of the proverb "Present yet absent" be? The first sentence of the fragment accuses an inexplicit "they" of not understanding and continues by saying that these others, although they have heard, are like the deaf. Presumably, this proverb--"present yet absent"--was said by the Greeks of the deaf, for though the deaf might be bodily present they are also absent in that they cannot hear. But from the context of this fragment, Heraclitus intends to extend this proverb to matters of "understanding." If, as I think reasonably obvious, the "they" in this fragment are the many who fail to understand Heraclitus, then Heraclitus is claiming that the many are like the deaf in that

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[21] Because just a part of the general situation is understood to stand for the entire general situation, the Generic Is Specific structure here is technically a metonymy (part-whole relationship) rather than a metaphor.

[22] Freeman, *Ancilla*, p. 27.

while their bodies are present, their minds are absent.

So the proverb in which the deaf are understood to be physically present yet auditorially absent has been extended to apply to a similar situation about mental activity--the many who hear and do not understand are physically present but mentally absent. (An everyday case leaps to mind: Those university students who go to college simply due to parental and social expectations are often an excellent example of beings physically present yet mentally absent.) The shape of the situation presented in the proverb (which speaks specifically about an bodily condition, deafness) has been extended to structure a more general situation--the life of the mind. As I have shown with the awake-asleep metaphor of the first two fragments, Heraclitus has again contrasted the reasoning with the unreasoning in the terms of a bodily source domain. In the previous fragments it was being asleep or awake, but this time it is the body's perceptual capabilities which provide the bases for the paradox's pronouncements about what it is to do reasoning.

Seen in this light, the Generic Is Specific metonymy is also the key to why Heraclitus writes in the form of cryptic paradoxes. By presenting us with a variety of specific paradoxes which call to us to be worked out, Heraclitus is awakening our general sense of the *logos*--of what it is to do reasoning. The specific situation (resolving a paradox or proverb) stands for the general class of situations (listening to the *logos* or reasoning). If on one level Heraclitus uses the Generic Is Specific metonymy as a cognitive tool in the construction of each particular paradox (such as we saw with "present yet absent"), then on the meta-level of expressing himself in riddles he may well have chosen the same cognitive tool as well. His cryptic paradoxes would then embody

specific thought experiments which stand for the general process of coming to know the *logos*. Given that so many of his paradoxes take the theme of reasoning and understanding (the *logos*) as their larger context, I think it is quite reasonable to conclude that Heraclitus is suggesting that this process of thinking is better taught by metaphor and riddle than by ordinary language and prose. The reason is that working out paradoxes instigates the kind of inquiry into the *logos* which constitutes actively *doing* philosophy. Thus upon my view, Heraclitus' choice of rhetorical form prompts hearers to think using conceptual metaphors and is thereby more than a mere wrapping that conveys the philosophical content independent of that wrapping. Instead, the rhetorical form of paradox is both part and parcel of Heraclitean philosophy. This conception of philosophical thinking as paradoxical and constituted by metaphoric reasoning is also important in the work of the Sophist Gorgias.

Gorgias and the Paradox of Rhetoric: To the Bounds of Rhetoric

In a chapter which purports to be on the importance of paradox to Presocratic philosophy, it may seem unusual to omit discussion of Zeno and Melissus. However, the paradoxes of infinite regression and motion simply do not compare to the magnificent paradox about the natures of rhetoric and philosophy raised by Gorgias. The paradox is raised not only by Gorgias' words, but his deeds as well. Gorgias professes to teach the art of rhetoric, and he does so without respect to the argument's end; he frequently challenges a doctrinal understanding. Among his surviving fragments there is his

"Encomium on Helen,"[23] which Gorgias begins by admitting that Helen is universally condemned for leaving Menelaus and eloping with Paris to Troy. Helen's condemnation is deeply doctrinal to the Greeks, who learn her story as told in the Homeric epics and several Greek tragedies. Gorgias proceeds to examine Helen's case, outlining four traditional possible reasons--fate, force, persuasion, or love--for why she acted as she did, and then ultimately concludes in each of these cases that she cannot be held accountable for her actions. This conclusion is precisely the opposite of what the ordinary Greek citizens would "know" doctrinally; hence, Gorgias is illustrating that part of what it means to speak in paradox is to speak against (*para*) the common opinion (*doxa*).

Both in the "Encomium on Helen" and in his other paradoxes, Gorgias presents us with longer and more intricate prosaic paradoxes than the stylistically compressed apothegms favored by Heraclitus. Despite this difference, I am going to show in detail how Gorgias' Helen paradox is also constituted by metaphoric reasoning about the "force" of argumentation. I will be concluding that Gorgias' use of the rhetorical form of paradox makes a point quite similar to what I have suggested about Heraclitus' use of the rhetorical form, and I will buttress this point by briefly discussing another of Gorgias' paradoxes. In my view, both of these thinkers are posing paradoxes in order to provoke their hearers to consider what philosophical inquiry is. Asking what philosophy is, of

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[23] Freeman, *Ancilla,* pp. 131-133. Robert Wardy has an excellent summary of the philosophical discussion concerning whether the Encomium was in fact an "encomium" (an *epi-deixis* or speech in praise) or a "defence" (an *apo-deixis*). See Wardy, *The Birth of Rhetoric: Gorgias, Plato and their Successors* (New York: Routledge, 1996). Once again, however, we must recognize that the key point is that Gorgias is writing before the invention of such classification schemes, which owe their origin to the slightly later work of Isocrates and Aristotle.

course, is very much a part of what it is to actually do philosophy, and if successful the use of paradox will not only awaken their hearers' philosophical sensibilities but enable them to engage them in the activity of philosophizing.

Within Gorgias' "Encomium on Helen" there are four arguments given, of which the first two are fairly perfunctory. First, Gorgias points out that if it was divine fate that compelled Helen to leave Menelaus, then surely a mere mortal cannot to be blamed for what is the will of the gods. He reasons that no one can be accountable for doing something they are *forced* to do by the fates. Secondly, if she were carried off by physical *force*, then clearly it would be her abductor and not she that deserved condemnation. These initial two arguments set the pattern that Gorgias' arguments on Helen's behalf will take. Every possible reason for Helen's actions will be reduced to an external force acting upon her, and so Gorgias argues she cannot be blamed for what she is forced to do.

Gorgias third argument is trickier: If it were by means of persuasive speech that Helen was persuaded to elope, then Gorgias has to show that speech has a power akin to physical force (*ananke*; often also translated necessity). Gorgias gives two lines of reasoning for this argument. The text of his first line of reasoning is both unfortunately missing some key words at a crucial juncture and consequently appears vague and incomplete, but the second line of reasoning--which has survived in its entirety--is a crystal clear example of metaphoric reasoning. He begins the first line of reasoning by observing that poetic language can elicit strong emotions and actions such as tears or shuddering which normally accompany those emotions. Next, he observes that this power of fictional

speech is a kind of wizardry (*gonteia*[24]) and magic (*mageia*[25]) in its ability to move the soul. Finally, he points out that these fictions are commonplace and not merely literary; for example, a person's mind (*psyche*) is often susceptible to what someone else says about events in matters where one's own memory is imperfect. At this crucial point the text is corrupt,[26] but from these points he concludes that speech possesses a kind of "force" which can change minds and stir us to actions: "... thus persuasion by speech is equivalent to abduction by force."

If third argument stopped with this assertion, the argument would be somewhat implausible. But Gorgias also cites examples of how minds can be changed in arguments about meteorology, legal contests and philosophical debates as a second line of reasoning that buttresses his contention that the *psyche* is susceptible to persuasive force. In a crucial passage, he likens the persuasive power of reason (*logos*) on the mind (*psyche*) to the effects of drugs (*pharmakoi*) on the body:

> The power of speech over the constitution of the soul can be compared with the effect of drugs on the state of the body: just as drugs by driving out different biles from the body can put an end either to the disease or the life, so with speech. Different words can induce grief, pleasure or fear; or by harmful persuasion words can drug and bewitch the psyche.[27]

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[24] Interestingly, this word refers most literally to juggling.

[25] *Mageia* comes from the Persian term for wise man, *magus*. It happens to have a similar sound to Greek terms for cookery (*mageipikos*). Plato uses this pun to devastating effect in his unflattering portrait of Gorgias in the dialogue of the same name. As I discuss in chapter two, the comparison of Sophistic reasoning with magic will also play an important role in Plato's portrayal of Protagoras .

[26] See Wardy for an elaborate discussion of the textual deficiencies and careful speculations as to how much text may have been lost.

[27] Translation adapted from Freeman, *Ancilla*, p. 132.

The metaphor system underlying the reasoning here is an elaborate and influential one which I will analyze in detail in the following chapter on Plato. In this metaphor, the mind is likened to a body, while words and ideas are the foods and drugs which are taken into the mind-body. Good foods lead to healthy bodies and, by extension, to good minds. When the body is not well, small doses of bad foods (drugs) can be taken in hopes of driving out the disease, but drugs are so powerful that they can bewitch the mind--lull it to sleep or drive it insane. Metaphorically, strong words--whether fine poetry or well-crafted arguments--can do to the mind what strong drugs can do to the body. With respect to Helen, Gorgias is implying--or perhaps the corrupt text would have made the connection explicitly--that Paris has drugged Helen with persuasive speech. Hence Gorgias can reach the conclusion that Paris has abducted Helen by persuasive force, just as skilled poisoner who drugged someone would have abducted her by physical force. The third argument is metaphorically structured, but its net result is the same as in the previous cases: If Helen were abducted by force, she is not to blame for the Trojan War.

In the fourth argument, in which the reason given for Helen's actions was love, Gorgias argues that compulsion due to love reduces to the first reason, compulsion due to the fates. He maintains that love, like fear, can be a result of our seeing something so tremendously *x* that it causes us to feel emotion *x*. He draws on a then contemporary understanding of vision, the Empedoclean theory, which states that sight is caused by objects emitting particles which *forcefully* impress themselves on the eye, causing vision. Thus the sight of something tremendously fearful can *force* someone out of their mind (as if they were forced by "fear" particles), as when troops flee at the first sight of an enemy.

Upon this theory the sight of something tremendously lovely can "force" someone to commit acts of passion. Since insanity was commonly regarded by the Greeks as either a form of possession by the gods or as a dreadful disease, the tremendous "force" felt by Helen in beholding Paris must stem either from the fates (the will of the gods) or from the power of the disease. If it were the will of the fates causing Paris to appear so lovely to her, then the gods would be to blame and not Helen. If Helen's insanity were caused by a disease, then Helen deserves no blame for her actions but is rather to be pitied for the misfortunes the fates have visited upon her. Thus, Gorgias argues that the fourth argument reduces to the first, namely that divine fate and not her own will compelled her to leave Menelaus. Gorgias concludes, "Therefore, whichever of the four reasons caused Helen's actions, she was innocent."[28] All four arguments depend on the point that she was abducted by force, and did not elope of her own volition.

The conclusion of the Gorgias' speech does not resolve anything, however; instead it raises a further paradox about the metaphor of persuasive "force" in argumentation generally. While contemporary thought might see problems with Gorgias' reasoning, for example, that his argument denies that Helen is at all a moral agent, or that the theory of vision he relied upon is simply not true, let the arguments stand a moment in order to realize that they were powerful for his contemporary Greeks. Not only is the conclusion opposed to the initial doctrinal understanding, but he has raised a further paradox about the limits of what *logos* (here used in the sense of argument or reason) can do. Should we

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[28] Freeman, *Ancilla*, p. 133.

accept Gorgias' arguments we would be faced with the paradox of rhetoric: on one hand, we have the tradition of condemning Helen, and on the other hand, powerful rhetorical arguments whose persuasive "force" implies that she was innocent. Are we to trust in such argumentation when it conflicts with what we feel we "know" from tradition? How may we resolve this paradox?

There are the obvious answers. The conservative Aristophanes[29] condemns Gorgias, rhetoric, Socrates and philosophy all together as mere Sophistry while affirming traditional modes of explanation. On the other hand, we may abandon the traditional mode of explanation entirely and succumb to the powers of argumentative rhetoric. Note that this abandonment does not necessitate belief in Gorgias' conclusion--we can still believe in the method of rhetoric and think he has made mistakes in his arguments, or relied on doctrines since overturned, and hence dispute his conclusion. But as I have argued with Heraclitus, the true resolution of a paradox does not come about by simply denying one doctrine or another, but by reconstituting the thinking that is prompted by the paradox. Again, the question I want to raise is what might Gorgias' texts teach about the process of doing philosophy in general?

Consider another one of the other surviving fragments attributed to Gorgias as it comes to us through Sextus Empiricus.[30] In this argument--reportedly a summary of Gorgias' book "On Being" or "On Nature"--Gorgias professes to show first that nothing

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[29] Aristophanes, *The Clouds,* trans. by Alan H. Sommerstein (London: Penguin Books, 1975).

[30] Freeman, *Ancilla,* pp. 128-29.

exists, second that if anything exists it is incomprehensible, and third that even if anything is comprehensible it is incommunicable. Granting a moment the argument, proving that nothing exists violates even the possibility of raising an argument in the first place, so why would anyone raise such arguments? At the end of the "Encomium on Helen" Gorgias answers the question of why he has composed that argument flippantly: "as an amusement for myself."[31] There is more than a kernel of truth in this quip, however. Paradoxes are amusing, especially ones which force us to marvel at their sheer audacity. Yet the proof of nothing existing, while certainly a clever satire of the philosophical project of Parmenides, is not as threatening a heresy as the heresy of the Encomium. It does not challenge something as doctrinally held as the condemnation of Helen--and to the extent that it does challenge something we deeply hold, it is absurd. Of course "something exists," we might reply, "we do, and the very fact of your being able to raise such arguments implies that we exist."

Yet I think both of his paradoxes are driving home the same general point: We want to believe simultaneously both that the conclusion to which Gorgias drives is absurd and also that argumentation has and should have the power to force us to change which of our opinions we regard as true. If we believe both of these, our only recourse is finding something wrong with Gorgias' arguments, and thereby committing ourselves to the very same activity, argumentation, which uses the metaphor system he has laid out in his Helen paradox in an attempt to "force" him or his followers to change their opinion on the

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[31] Freeman, *Ancilla*, p. 133.

matter. The point is that no matter what we do, we are to be hoisted on his petard.

I think it is profitable, therefore, to read the Gorgian rhetorical paradox after the same fashion in which I brought out the general point made by Heraclitus' use of philosophical paradoxes. Perhaps what Gorgias is doing as he poses these paradoxes is circumscribing the bounds of our argument. If so, I would say that he is obliquely hinting that argument is simply not due all the credit we would give it. He would be suggesting not only that argument does not have the power to change minds as forcefully as we might think, but that argument alone should not change our minds. If his paradoxes can be turned to this end, then perhaps we ought to take Gorgias' sly final comment about the purpose of his compositions being "his own amusement" with a grain of salt. Instead of letting truth rest on the conclusion of our arguments, why not identify it with the process of inquiry? Seen in this light, the source of Gorgias' amusement becomes more palatable--he is laughing at those who would take his delightfully absurd conclusions as comprising a new doctrine, instead of understanding his paradoxes as simply raising questions about the method itself and the faith we put in the conclusions that argument engenders.

What I take Gorgias to be arguing is that we must question the argumentative method along with the argument's conclusions. To the extent that the methods of philosophical argumentation and philosophical inquiry are themselves constituted by and relying upon metaphors such as argumentative or persuasive "force" that could potentially lead us into absurd conclusions, we need to keep questioning our methods in both a self-reflective and self-reflexive fashion. Thus Gorgias, like Heraclitus, uses metaphors to construct paradoxes which cause us to think not just about the particular paradox posed,

nor just to think philosophically using the metaphors set out by the paradox, but to actually do a kind of philosophy which uses metaphoric reasoning to inquire self-reflexively about what it means to do philosophy at all.

Conclusion: The Need for a Distinction Between Philosophy and Rhetoric

Philosophy's performative aspect almost always fades into the background. The process of inquiry itself is usually eclipsed by turgid expository prose. That, as I will argue in ensuing chapters, is a legacy of Aristotle. But before exposition became the normative form in which philosophy is to be done, Presocratic thinkers used a conception of philosophy as paradox to prompt their students to actually *do* philosophy, to engage in philosophical thinking. These thinkers did philosophy, though without having the genre which was later to be formally defined as appropriate to philosophy, as they taught their reflections on the process of inquiry through paradox.

However, this capability of Gorgias and the other Sophistic rhetoricians to argue not just paradoxically but against any position, irrespective of the merit of the position to which the argument is put--or, to put it another way, this capability to use metaphors in argumentative oratory designed to assimilate the Athenian *demos* (people, mob) to the rhetor's (or his patron's, if he is paid) predetermined position--this capability was a dangerous power in the Athenian democracy. Plato saw that the right antidote for that power was a more systematic reflection on teaching method and the process of inquiry. If it were possible to educate the *demos* to challenge the rhetors rather than be swayed by

them, it might be possible to curtail the power of the rhetoricians. Onto that stage Plato has Socrates enter; a mere stone-cutter, an antihero, a questioner, always the defender of the dull and those incapable of making (or understanding) long speeches. Socrates teaches, example by repeated infuriating and yet insightful example, the same paradoxical insight that I see in Gorgias' moment of self-disclosure; namely, that there are always questions to be asked about whether our methods and philosophical metaphors are the right ones. Inquiry must be self-reflective about the metaphors used in argumentation.

Understanding how philosophy is shaped, at its earliest constitution, by a conception of philosophy as paradox is crucial for understanding why later philosophers attempt to distance philosophy from metaphor and to exile metaphor to the rhetoricians. In this chapter I have argued that the rhetorical form of the paradox carries philosophical content with it, and that conceptual metaphors are crucial tools for understanding those paradoxes. The Heraclitean paradox of the *logos* and the Gorgian paradox of rhetoric have much in common. Each illustrates the power of metaphorical reasoning and its importance to the "practice of thinking." In the next two chapters I will explore how conceptual metaphors and metaphorical reasoning are gradually turned to the paradoxical end of envisioning philosophical systems of purely expository prose that is devoid of metaphor.

Though it has many important byways and detailed diversions, the overall argument of the next chapter proceeds as follows. When Plato names the "practice of thinking" philosophy, he does so by distinguishing philosophy from rhetoric. Plato's Socrates is forever questioning the metaphors of the rhetoricians, seeking out a point

where metaphoric reasoning falters. When Socrates does spot a discrepancy, he seizes on it to bring those metaphors under scrutiny and turn them into analogies. As analogies are comparisons between multiple different domains of experience, Socrates insists that we should properly restrict the explanation and investigation to just one domain, that of the matter which is under consideration. Whenever an interlocutor resists this move and the subject matter becomes questioning whether Socrates' proposed restriction is in fact a wise restriction, Socrates ironically pleads that he lacks wisdom and intelligence. Though his performance belies it, Socrates is always paradoxically disclaiming that he is propounding a theory of reasoning. It is as if Socrates is saying "Unlike you Sophists who profess to teach rhetoric, who are of the commonly held opinion (*doxa*) that this art of reasoning can be taught, I would argue against (*para*) you that this art cannot be taught." Yet Plato has Socrates perform in a way which teaches that there must be a *logos* according to the domains are independent of one another and known only in themselves, only according to their own internal logical and causal necessities. Plato terms this paradoxical teaching by example of what is supposedly unteachable "philosophy," a word whose well-known derivation is from *philo* (love, want, lacking) compounded with *sophos* (wisdom). But this transition from metaphor to analogy to understanding things only on their own terms is more properly the subject of the next chapter.

CHAPTER II

METAPHORS BEWITCH, ANALOGIES ILLUSTRATE AND LOGIC FAILS: METAPHOR, ANALOGY AND DISANALOGY IN PLATO'S *PROTAGORAS*

> When we had entered, we came upon Protagoras as he was walking about the portico, and close behind him were two companies walking round also.... the greater part of them appeared to be foreigners, whom Protagoras had brought with him out of the various cities visited by him on his journeys, he, like Orpheus, enchanting them with his voice.... Nothing delighted me more than the precision of their movements: they never got into his way at all; but when he and those who were with him turned back, then the company of listeners parted regularly on either side; he was always in front, and they wheeled round and took their places behind him in perfect order.[1]

Philosophers on Stage

When I teach an introductory course in philosophy, I always begin with an analysis of the architectonics of the lecture hall. As the teacher I am given the podium and the stage, while the students are the audience whose bodily posture is architecturally constrained so as to focus their attention on the teacher. If the class is in a large lecture hall, I may make reference to the ways in which it draws on the design of the Greek

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[1] Plato *Protagoras* 314e-315b, trans. H. Lamb (Cambridge, MA: Loeb Classical Library, Harvard University Press, 1924). The translations in this chapter are usually my own, though I have consulted several translations as guides. I will follow a practice of restricting myself to using only a few key Greek terms in the text, with most transliterations of the original Greek left to the footnotes.

theater; if it is a smaller room, I always contrast our present surroundings with one of the large lecture halls on campus. The reason for this lesson is simple: the organization of space in the lecture hall reflects a distinctly metaphorical theory of teaching. When the philosopher is on stage, ideas are treated as objects, teachers as transmitters and students as passive receptacles. Tests are typically structured to measure how many "idea-objects" a student has successfully apprehended, and students are graded according to how well they return those objects to the teacher on a bubble-form exam. Too much of the university and too much of the world lives by this metaphor, but I always make it clear to students that that is not what we will do in our philosophy class. If philosophy is a subject which concerns us all, I suggest to the students, then philosophy is a subject better taught in dialogue, where the goal is to teach students both to discover and to sharpen their own voices. If we understand teaching philosophy as a journey which we all undertake, then the teacher is a simply a more experienced traveler and guide than the student, but all are engaged in trying to travel to the various "idea-destinations" we will study. This metaphor stresses learning from the process of comparing perspectives as we travel the educational journey, while the former metaphor demeans education as the mere dissemination and regurgitation of facts.

Plato's *Protagoras* is a dialogue dear to my heart not so much for what it has to say about its ostensible subject--whether *areté* (excellence, civic virtue) can be taught--but for what it has to say about the teaching of philosophy. In the dialogue, Socrates does exactly what philosophers are supposed to do. He challenges our ordinary understanding of teaching philosophy by finding discrepancies in one of the primary metaphors we have

for teaching. In the process, he turns the metaphor into an analogy with accompanying disanalogies, and then concludes we ought to study *areté* in itself before asking whether or not it can be taught.

Perhaps unsurprisingly given Socrates' description of his lecture style that I quote at the outset of this chapter, Protagoras' metaphor for teaching is that teaching is a kind of motion. Specifically, teaching philosophy is guiding others along the journey toward excellence. In this dialogue Socrates argues against this metaphor for teaching philosophy. The dialogue turns on a subsidiary question, that of whether or not excellence is knowledge, and their respective metaphors for teaching knowledge are what lead them to take the positions they do on this question. Socrates maintains that civic virtue is a kind of knowledge, yet he thinks that this kind of knowledge may not be taught; Protagoras argues that civic virtue is not "knowledge" in Socrates' sense, and that virtue is teachable. In this dialogue Socrates draws his inferences, based on both analogies and disanalogies, primarily from the metaphor of teaching philosophy as the transmission of idea-objects. In Socrates' proffered metaphor, civic virtue is an idea which must be passed from teacher to student as an object would be passed between them--precisely the conception of teaching reflected in the design of the large lecture hall.

There are two often overlooked but important details about the dramatic setting which are crucial to understanding why Plato poses this conflict of metaphors in the dialogue. The first detail is the dramatic date, and it helps us understand why Socrates exclusively uses this metaphor to characterize the teaching of knowledge in this dialogue. For Protagoras (490-420 BCE) and Socrates (470-399 BCE) to have met, this would have

to have been a comparatively younger Socrates than the more polished Socrates of the *Republic* and certainly of the *Apology* and the *Crito*, in all of which Plato has Socrates make carefully constrained uses of the Teaching Is Guiding metaphor.[2] This dialogue allows a glimpse of a younger and somewhat overeager Socrates who, rather than arguing with yes-men, faces such strong opposition that Plato perhaps has him learn something from Protagoras that he will only later adopt. What I think that Plato has Socrates learns from his encounter with Protagoras is how to use a Teaching Is Guiding metaphor in a way which is constrained by his insights about why ideas must be treated as objects, and in the dialogues set with a later dramatic date he adopts this metaphor in its more constrained form.

The second detail is that, properly speaking, this dialogue is not a dialogue at all--Protagoras speaks only through the voice of Socrates recounting their interaction. At times Socrates' retelling threatens to degenerate into no more than his tale of a public spectacle: his boxing match[3] of words with the reigning champion of the time, Protagoras. Why does Plato frame the real dialogue within Socrates' retelling? With the framing, we readers are once removed from immediate action and encouraged to identify with the anonymous friend to whom Socrates relates the tale. As when we hear the account of their own contest from one of our own friends, we might well question the narrator's

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[2] For a discussion of the question of dramatic date and the date of composition, see W. K. C. Guthrie's *A History of Greek Philosophy*, six vols. (New York: Cambridge University Press, 1962-81), 4: 213-215.

[3] This metaphor comes directly from Plato *Protagoras* 339e: "This sally evoked praise and applause from many of the audience, and at first I was like a man who has been hit by a good boxer (*agathou puktou*); at his words and the applause things went dark and I felt dizzy."

impartiality, even though the words are those of our friend or of such a reputedly truthful speaker as Socrates. Both the dramatic date of this dialogue and the framing of the philosophical dialogue with a near-monologue invite us as readers to take a critical stance toward the arguments and metaphor Socrates offers.

Taken together, these two considerations serve to underscore the importance of perspective to knowledge as one of the dialogue's major themes. Just as we are invited to consider the effects of perspective in how a younger and hot-blooded Socratic boxer might be influencing his account of a feisty argument as he recounts it to his friend, so we are invited to consider the effects of perspective on knowledge generally. The differences here are sharply drawn; Protagoras' understanding of teaching as guiding suggests that we are all travelers on the same road, and that his claim to being a teacher of *areté* is based on having lived a long life, being well-traveled, and having seen *areté* from the differing perspectives of many different cultures. In stark contrast to Protagoras' relativism, Socrates argues that only someone who possesses the requisite objective knowledge of *areté* in itself can teach it. This reasoning is a straightforward conclusion given the metaphor for teaching Socrates thinks through in this dialogue. If teaching consists of sending the right objects of knowledge along a conduit to the students, then the only teacher worth listening to is one who already possesses those ideas.

I should also call attention to the typically Socratic suspicion of the power of words to enchant. The comparison of Protagoras to Orpheus in Socrates' description of this "lecture hall" is part of Plato's challenging of the tradition of rhetoric throughout the dialogue. In my discussion of the metaphors underlying Gorgias' paradoxes in the first

chapter, the force of an argument to persuade its hearers was likened to the magical ability of rhetoric to bring us to imagine and to feel what the words describe. If rhetoric has a magical power to persuade, then Socrates would be wise to be wary of any attempts on Protagoras' part to enchant him and to lull his intelligence to sleep. If there is to be hope of teaching his fellow Athenians to resist and think through the speeches of the rhetors, then Socrates must be careful to distinguish his philosophical method from the magical arts of the rhetor and poet. Here Plato again uses the dramatic elements of the dialogue--namely the constant threat of its dissolution--to encourage us to consider how the differences in philosophical inquiry are shaped by the choice between two different rhetorical forms, with long-winded Protagorean speeches on the one hand and short staccato Socratic questioning on the other. It is a fitting piece of Platonic irony that the distinction between rhetorical arts and philosophic method is drawn by the dramatic means of the rhetorical arts.

The Argumentative Backdrop

Within this second chapter I will be arguing five important related themes. On the surface I will be arguing that Socrates is arguing for the superiority of the Teaching Is Transmitting Objects metaphor over Protagoras' Teaching Is Guiding metaphor. Nonetheless, Socrates is also aware that his metaphor is occasionally misleading, and I will show how even before the encounter with Protagoras begins Socrates is critically examining the limitations of reasoning using his proffered metaphor. This act of critically

examining particular metaphors is my second important argumentative theme, in which I will show how Socrates' argument in this dialogue is constituted by *disanalogical*, rather than analogical, metaphorical inferences. In the following section of this chapter I will give a more thorough treatment of disanalogical metaphoric inferences complete with two examples, but it is important for this summary of my overall argument to understand the basic distinction. A disanalogical inference is a form of metaphorical inference in which a dissimilarity, along with other similarities, propels one to a particular conclusion. It stands in contrast to the more usual analogical inferences which are formed solely on the basis of similarities. The metaphoric reasoning of the Presocratics and Sophists I have presented in chapter one was analogical metaphoric reasoning, by which I mean that it led one to project reasoning from the source domain into the target domain in a straightforward way. But metaphors can be more than just leading; they can also be *mis*leading, as sometimes the attempt to project the reasoning of the source domain to the target domains doesn't quite work. In these cases however the metaphor can often be adapted to produce a conclusion which explicitly takes into account the differences as well as similarities between domains, and I argue that it is this variety of metaphoric reasoning that Socrates uses to such acute effect in this dialogue.

Third, I will argue that Socrates develops this method of the critical examination of metaphors via disanalogy into the rhetorical form of cross-examination (*elenchus*) that he poses as a contrast to the rhetorical form of long speechmaking as used by Protagoras. Thus I will argue that Socrates presents us with not only his reflections on what particular metaphor should govern our notions of teaching and of philosophical inquiry, but also his

reflections on how the critical examination of metaphoric reasoning shapes the rhetorical form in which philosophical inquiry is to be done. In this new rhetorical form Socrates breaks the metaphors of Presocratic philosophical thinking down into their analogies and disanalogies, and then argues that this process reveals that we need to understand things not just metaphorically but on their own terms. Fourth, I will argue that Plato's use of the dramatic elements of the dialogue--a usage which gives us a rather less than entirely sympathetic portrait of Socrates--encourages us to take a critical perspective of our own on the Socratic method as we think through Socrates' arguments as presented in this dialogue and elsewhere. The fifth theme I will argue is that despite their use in sketching the somewhat unflattering portrayal of Socrates in this dialogue, Plato also uses these same dramatic elements to contrast Sophistic rhetoric with Socratic philosophy as different disciplines. I will conclude this chapter by suggesting the metaphors Plato uses to draw that distinction lead to a certain flawed conception of metaphysics. But as that metaphysics is more fully explicated in Aristotle, I shall for the most part reserve my explicit discussion of it until the following chapter.

It is also important for me to explain how the argumentative furniture of this second chapter is situated against the overall argumentative backdrop of the whole dissertation. I have argued thus far that Heraclitus' and Gorgias' paradoxes prompt the hearers to do certain philosophical conceptual work. Further, I have analyzed the details of some of those paradoxes to show how they are constituted by metaphoric reasoning patterns, and to show how the particular conceptual metaphors used project knowledge from bodily experience in an attempt to understand and conceptualize something much

more abstract; namely, the nature of reasoning or argumentation (the *logos*). At that point I observed that while it is one thing to show that the philosophy presented in the form of paradoxes is constituted by metaphoric reasoning, it is another to extend that claim to philosophy presented in other rhetorical forms.

Thus it now becomes important to revisit what it means for metaphors to be constitutive of philosophy. Minimally, what the constitutive claim entails is that metaphors are necessary for philosophical reasoning. To this end I will argue in this second chapter against Socrates' proposal that disanalogies reveal essential differences between the nature of things-in-themselves, and also against his further claim that such differences reveal that the thing-in-itself--in this case, virtue considered as such--is the proper subject of philosophical inquiry. Instead, I will show in detail how the disanalogical reasoning used by Socrates requires first firmly establishing a basis in metaphoric reasoning in order to make such disanalogical inferences possible. Due to its basis in metaphor, I will argue that metaphoric reasoning is not inessential but essential to his proposal that philosophy should concern itself only with the nature of the object-in-itself. In this sense the use of some metaphors is necessary for, and therefore constitutive of (in this minimal sense), philosophical inquiry. This holds true even when the use of metaphor is disanalogical, as is often the case for Socrates. Minimally, the constitutive claim maintains that although we might change our philosophical metaphors, we cannot escape using metaphors as we do philosophy.

So far my claim this minimal claim about the constitutive character of philosophical metaphors is precisely what I have been arguing in the first chapter. As much as the use of

various different metaphors in Heraclitus' and Gorgias' paradoxes constitutes what instigates the self-reflexive inquiry on what it means to reason, Socrates' use of disanalogical metaphoric reasoning patterns constitutes what is to count as philosophical inquiry in the Socratic tradition. As with Presocratic paradoxes, Socratic disanalogies cause us to be self-reflective *both* about the particular metaphors which we are using to structure our understanding of the further thing *and* about the use of metaphors generally in philosophical inquiry. Disanalogies do the former by raising questions about whether the source of understanding in a metaphor is adequate to understanding the target, and they do the latter by raising the question of whether we should use metaphors at all in argumentation. Arguments given in the rhetorical form of Socratic disanalogies are thus continuous with the metaphoric reasoning in the rhetorical form of Presocratic paradoxes, and yet they instigate an even more detailed reflection on the relationship between metaphoric reasoning and philosophical inquiry.

However, in this second chapter I am also beginning a larger argument about an even stronger version of the constitutive claim than the minimal one I have been establishing thus far. Namely, the next step in the argument is explaining how the *particular* metaphors Socrates (and Plato) take as constitutive of philosophical inquiry lead to their particular philosophical positions. As a case study, I will analyze how their particular metaphors for teaching shape their disagreements throughout the argument of this particular dialogue. In this case I will argue that Socrates cannot fully endorse a Teaching Is Guiding metaphor because he is committed to his own metaphors, and toward the very end of the conclusion of the dialogue he argues that entailments from his

preferred metaphors must constrain any use of the Teaching Is Guiding metaphor. This point is particularly important because Socrates does use Teaching Is Guiding metaphors in other dialogues with later dramatic dates, such as the *Republic* or the *Crito*.

On the face of it, this seeming capacity of Socrates to apparently adopt a rival metaphor and yet still argue for the same philosophical position might appear to be evidence against my stronger claim that particular metaphors constitute a particular philosophical position. However, I will explain a key disanalogy so fundamental to Socratic (and Platonic) metaphysics that it constrains Socrates use of guiding metaphors by implying that all one needs to do to be a good teacher is guide the student to an idealized philosophical "perspective" from which everything can be surveyed, rather than implying that one should guide the student through many different perspectives as they try to become virtuous. While I will not be giving another detailed analysis the textual evidence for any of the other dialogues in which Socrates uses the guiding metaphor, I will explain how this disanalogy is used to generate a counterargument to the more straightforward Protagorean use of the guiding metaphor and only briefly explain how it constrains Socrates' own use of that metaphor. This explanation proceeds in outline as follows.

In this metaphysics knowledge is considered to be objective and universally true, irregardless of how something might appear to us from a particular perspective. I will argue that this conception of objective knowledge is constituted by a disanalogy in a metaphor which is closely related to the Teaching Is Transmitting Objects metaphor: namely, a Knowing Is Seeing metaphor. Both of these metaphors share a central mapping,

namely that the idea is an object. The key disanalogy stems from the fact that the apparent size of an object as seen from a particular perspective does not always match the size of object as known via measurement. This disanalogy is a disanalogy between bodily sight and philosophic "sight" (that is, knowledge), and what Socrates takes from it shows that a particular bodily perspective is irrelevant to knowing something objectively. In the final section of this chapter I explain how this philosophical position on knowledge is a consequence of this particular disanalogical metaphoric inference, and indicate how that insight is supposed to constrain any further use of the Teaching Is Guiding metaphor.

The disanalogy which produces this supposed insight about the nature of knowing is thus also the reason why Socrates is arguing for the superiority of the Teaching Is Transmitting Objects metaphor over the Teaching Is Guiding metaphor. I will show that Socrates rejects Protagoras' attempts to shift the metaphoric ground from idea-objects to guiding. Instead, he argues that the insight about the objective character of knowledge is so important that a good teacher must take this insight into account and guide students to see not just a succession of perspectives, but bring the students to "see" things as they really are. As a disanalogous entailment derived from a particular metaphor is what serves to constrains the Protagorean metaphor, Socrates is arguing for that the closely related Teaching Is Transmitting Objects metaphor is a better one for understanding the teaching of knowledge. Hence, in my overall argument for the stronger version of the constitutive claim I will be discussing not just the overall pattern of disanalogical reasoning (which is what I call a rhetorical form) that yields a metaphysical hypothesis of objective knowledge, but also discussing how these *particular* metaphors (and especially this particular

disanalogical metaphoric inference) shapes that metaphysics and, finally, suggesting how this disanalogy then constrains how Socrates uses the Teaching Is Guiding metaphor in other dialogues.

Lastly, I should make explicit what the role of the embodiment hypothesis will play in this overall argument, especially with respect to this chapter. The embodiment hypothesis maintains that in a conceptual metaphor we take our knowledge of a source domain and project it onto the target domain. As I have mentioned in chapter one, the empirical research has shown that the range of the source domains used in conceptual metaphors draws systematically from bodily activities. While the arguments about the metaphysics of objective knowledge will not reach fruition until the subsequent chapter on Aristotle, the metaphysical view that I will elucidate in these next two chapters maintains that knowledge is both objective and disembodied. As I have just indicated, I will show that the argument for the supposed disembodied character of knowledge also stems from a key disanalogy between bodily sight and philosophic "sight" (knowing). In their very conception, the objects of knowledge are constituted by a disanalogy in which the projection of what we ordinarily know about bodily sight onto knowledge is blocked. Unlike the objects of bodily sight, the objects of knowledge are not seen from any particular human perspective. Instead, these objects are "seen" (known) as they really are, had we already measured them.

Thus I will argue the objects of knowledge are supposed to be disembodied in two ways. First, this extraordinary philosophic "sight" implies taking not an ordinary embodied perspective but a disembodied philosophical "perspective." Second, knowledge

is supposed to be disembodied because, as the use of disanalogies constitutes a method of investigation which is supposed to reveal what things essentially are in themselves, what this disanalogy supposedly reveals is that the nature of philosophical "seeing" (knowing) in itself is different in kind from embodied sight. When questions of form and method are considered alongside this particular disanalogy, I argue that this key disanalogy is not only supposed to reveal to us that philosophical knowledge is disembodied as well as objective, but it is also the genesis of the view that philosophical reasoning and language are to be primarily concerned with the literal and non-metaphoric characteristics of the nature of the thing itself. This last position, of course, is precisely the one that the evidence for the embodiment hypothesis contraindicates. However, as this last point is among the broadest of the claims I am arguing in this dissertation, I will be continuing to develop this point over the course of the rest of the dissertation. However, it has its basis in the metaphoric reasoning I am about to discuss.

The Prologue's Metaphors: Meditations on How to Choose a Teacher

As the dialogue opens a friend hails Socrates, asking him how his erotic pursuit of Alcibiades has progressed. Socrates' reply takes his friend by surprise--that he has been with Alcibiades but thought little of him, so captivated was he by another beauty. The friend cannot believe this to be the case, until Socrates teasingly informs him that he has had a talk with Protagoras, "the wisest man living." Astonished at the news, the friend bids him to tell the tale, and Socrates assents. In this first frame, Plato has not only

removed the real dialogue into a narrative of Socrates, but he has also introduced the conversation as an encounter on the erotic hunt, a move consonant with Socrates' conflation of erotic beauty with wisdom. Socrates, ever the lover of wisdom, has no time for pursuing the physically beautiful Alcibiades when he can pursue the wisest man alive. Socrates has been so distracted by the beauty of Protagoras' wisdom that he ironically remarks that at one point in the argument Alcibiades even had to come to Socrates' defense--an ironic reversal of the pursuit of the beloved by the lover.[4]

The tale Socrates tells begins with his being awakened before dawn by an overanxious youth bearing the news that Protagoras has arrived in Athens. Hippocrates, a young Athenian noble, calls on Socrates because he is in need of an introduction to this cleverest of speakers, whom he hopes he can persuade to become his teacher. As it is a bit too early to call on Protagoras, Socrates suggests they walk together in the garden, where he begins to cross-examine the youth on his desire to take Protagoras as his teacher.

In this extended prologue to the main dialogue with Protagoras, Plato has Socrates draw an elaborate parallel between the art of the Sophist Protagoras and that of the Hippocrates' namesake, the famous physician. Under questioning young Hippocrates admits that if he were to pay the famous physician Hippocrates a fee to become his teacher, he would expect the physician would train him as a doctor; similarly, if he went to a sculptor, he would expect the sculptor would teach him sculpting. What then does

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[4] Plato *Protagoras* 309a-310a.

Hippocrates hope that Protagoras can teach him? The suggestion that training with a Sophist would lead Hippocrates to become a Sophist makes him blush with shame, and it emerges instead that Hippocrates expects to receive instruction that will better his soul (*psyche*). In framing the dialogue with this parallel Socrates is foreshadowing his later line of attack on Protagoras when Socrates, playing the part of a responsible elder, will interview Protagoras as a prospective teacher on Hippocrates' behalf. The method of attack will be to pin Protagoras down on exactly what subject Protagoras claims to be an expert, and to see if Protagoras is indeed a master of the trade he claims to teach.

It is worth analyzing this remarkable passage in some detail to see how Socrates' conception of Protagoras is informed from the beginning by Socrates' understanding teaching in the terms of a Teaching Is Transmitting Objects metaphor. Since Protagoras charges for his teaching time, Socrates initially assumes that Protagoras must conceive of teaching as a kind of selling. When teaching is offered for pay, this metaphor gains additional specificity: it becomes the Teaching Is Commerce metaphor, in which *sophia*[5] (wisdom) is a trade, ideas and knowledge are objects for sale, teaching is selling ideas and learning is purchasing them, and the teacher-student relationship is a commercial relationship. This passage follows in its entirety:

> [Socrates:] Tell me, Hippocrates, I said, as you are going to Protagoras, and will be *paying your money* to him, what is he to whom you are going? And what will he make of you? If, for example, you had thought of going to Hippocrates of Cos, and were about to *give him your money*, and some one had said to you: "You are

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[5] It is important to keep in mind that Plato has not yet introduced the term *philosophia* into the dialogue, and the wisdom which Protagoras claims to teach is only that of *sophia*, which can also mean "practical" wisdom.

paying money to your namesake Hippocrates; tell me, what is he that you *give him money*?" How would you have answered?

[Hippocrates:] I should say, he replied, that I *gave money* to him as a physician.

[Socrates:] And what will he make of you?

[Hippocrates:] A physician, he said.

[Socrates:] And if you were resolved to go to Polycleitus the Argive, or Pheidias the Athenian, and were intending to *give them money*, and someone had asked you: What are Polycleitus and Pheidias? and why do you *give them this money*? How would you have answered?

[Hippocrates:] I should have answered, that they were sculptors.

[Socrates:] And what will they make of you?

[Hippocrates:] A sculptor, of course.

[Socrates:] Well now, I said, you and I are going to Protagoras, and we are ready to *pay him money* on your behalf. If our own *means* are sufficient, and we can *gain* him with these, we shall be only too glad; but if not, then we are to *spend the money* of your friends as well. Now suppose, that while we are thus enthusiastically pursuing our object some one were to say to us: "Tell me, Socrates, and you Hippocrates, what is Protagoras, and why are you going to *pay him money*?" How should we answer? I know that Pheidias is a sculptor, and that Homer is a poet; but what title is given to Protagoras? How is he called?

[Hippocrates:] They call him a Sophist, Socrates, he replied.

[Socrates:] Then we are going to *pay our money to him* in the character of a Sophist?

[Hippocrates:] Certainly.

[Socrates:] But suppose a person were to ask this further question: And how about yourself? What will Protagoras make of you, if you go to see him?

[Hippocrates:] (He answered with a blush upon his face, for the day was just beginning to dawn so that I could see him.) Unless this differs in some manner

from the previous cases, I suppose that he will make a Sophist of me.[6]

The points of analogy are summed up in the metaphor mapping[7] given in Table 1. It is important to see that this metaphor has various inferential entailments implied by its mapping. If ideas are objects and teaching is their sale, then one of the important considerations in choosing a teacher is that the teacher be someone who possesses the requisite objects of knowledge. Should a student acquire enough of these idea-objects,

TABLE 1. The Teaching Is Commerce Metaphor

Commerce (source domain)		Teaching (target domain)
objects for sale	→	ideas, knowledge
acquiring objects	→	learning
selling objects	→	teaching
person who sells (transmits) objects	→	teacher
person who acquires (receives) objects	→	student
person buying object from another	→	teacher-student relationship
cost of objects	→	value of idea/knowledge
body (of person who acquires objects)	→	mind or soul (of student who learns ideas)

[6] Plato *Protagoras* 311b-312a. I have italicized the terms which make the commercialization of the teaching of wisdom clear.

[7] A metaphor mapping is not a set of fixed correspondences, but rather a flexible set of bodily motivated and dynamic connections across two conceptual domains. The column of the left is the source domain, and the column on the right is the target domain. The claim made by cognitive scientists working on metaphor is that the source domain imparts inferential structure to the target domain. For theoretical accounts of mappings, see George Lakoff "The Contemporary Theory of Metaphor" in *Metaphor and Thought*, 2nd ed. rev., ed. by Andrew Ortony (New York: Cambridge University Press, 1993, pp. 202-251), and Mark Johnson *Moral Imagination: Implications of Cognitive Science for Ethics* (Chicago: University of Chicago Press, 1993).

presumably the student will become an expert and be a potential teacher in their own right. These two metaphorical entailments are why Socrates leads on Hippocrates in the conversation by asking him whether if he paid money to a physician he should expect to become a physician, and so on. Socrates wants to know what knowledge Hippocrates believes Protagoras possesses.

Socrates has set up this metaphor of Teaching Is Commerce to challenge its entailment that in order to teach wisdom one must be an expert in the trade of wisdom; Socrates is never an enthusiastic proponent of the position that philosophy should be taught for a fee. The key disanalogy (i.e., the key difference between the domains of teaching wisdom and commerce) is that although Hippocrates would expect that studying with most teachers would train him to be an expert in that field, he does not go to Protagoras with that expectation. In a skillful dramatic touch, Plato times Hippocrates' blushing denial that his paying money to Protagoras will make him a Sophist to coincide with the coming of the dawn. The intellectual dawn is not merely Hippocrates' realization that he does not intend to become a Sophist, but the realization that Socrates has introduced a disanalogy which threatens to derail the entire train of reasoning to which Hippocrates has consented.

The disanalogy points to a difference between teaching in the technical trades and teaching wisdom. The key difference is that Socrates supposes that the study of wisdom--what might now be called philosophy or, more generally, the humanities--differs from the technical trades in that the technical trades are pursued for values external to their practices, while the humanities are studied for values internal to their practices. Hence,

and unlike in the technical trades, Socrates argues that it is not simply the acquisition of idea-objects which makes one an expert in and a teacher of the humanities. I have diagrammed this disanalogous inference in Figure 1 (the disanalogous parallels are marked by asterisks).

Commerce of Ideas (Source Domain)	Teaching Wisdom (*Sophia*) (Target Domain)
1) One learns a technical trade (doctoring, sculpting) by acquiring idea-objects about it	1) One learns wisdom by acquiring idea-objects
2) One teaches a technical trade by transmitting idea-objects to others	2) One teaches wisdom by transmitting idea-objects to others
3) In the technical trades, one expects to acquire expertise when one has acquired enough idea-objects about the trade	3) *Unlike in the technical trades, one does not expect to acquire expertise in wisdom when one has acquired enough idea-objects about wisdom
Therefore, one studies with an expert in order to become an expert in that trade	*Therefore, one does not study wisdom with a Sophist (a teacher of wisdom) in order to become a Sophist but for some other purpose

FIGURE 1. A Disanalogous Metaphoric Inference Based on the Teaching Is the Commerce of Ideas Metaphor

Hippocrates quickly consents to what Socrates proffers as the reason behind this difficulty: the teaching of wisdom is different in kind from technical instruction. While technical instruction works well with the sort of knowledge pursued to become an expert, Socrates suggests that the teaching of wisdom is similar in form to the instruction given to the young as they learn language, music and gymnastics. A student studies language, music and gymnastics not necessarily to become trained as an expert in them, but as part of one's general education; wisdom and the humanities are studied for the same sort of reason.

However, Hippocrates' paying Protagoras in this capacity worries Socrates even more, and the structure of the dialogue's fugue--metaphor, analogy, disanalogy--is repeated again. This time the mapping (or point of analogy) of the Teaching Is Commerce metaphor system to be challenged is understanding the soul (or mind) as a body. Socrates sets up this point of analogy up in his proffered solution to the problem posed by the previous disanalogy. His solution made use of understanding the mind as a body in suggesting that just as the language teachers, the musicians and the gymnasts instruct the body,[8] so the Sophist (the teacher of wisdom) instructs the mind.

What worries Socrates is that he believes that the care of the *psyche* is a much more serious affair than the care of the body. In order to make Hippocrates see this difference, he uses a specification of the "ideas are objects" mapping to set up a second disanalogy. The Teaching Is Commerce metaphor is given even greater specificity in order for it to mesh closely with understanding the mind as a body; ideas are understood not merely as objects for sale, but as foods for sale.[9] The relevant passage begins:

[Hippocrates:] And what, Socrates, is the *food of the soul?*

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[8] Presumably the language teachers instruct the body in teaching one to shape one's mouth. Plato *Protagoras* 312b.

[9] As Lakoff ("Contemporary Theory of Metaphor") and Johnson (*Moral Imagination*). have argued, metaphors can often be organized into an *inheritance hierarchy* in which metaphors are given greater specificity the farther down the inheritance hierarchy one travels. For example we have a general metaphor, Love Is a Journey, in which the travelers are lovers, the relationship is a vehicle, and the relationship's outcome is their mutual destination. That metaphor may be given additional specificity by articulating what kind of journey the lovers are travelling on: "we're in rough waters now" (voyage by ship), "in the fast lane of love" (freeway automotive travel), and so on. Similarly, the Teaching Is Commerce metaphor is given greater specificity by designating the objects for sale to be food, while the commerce metaphor is in turn a specification of the even more general metaphor in which teaching is the transmission of ideas.

> [Socrates:] Surely, I said, knowledge is the *food of the soul;* and we must take care, my friend, that the Sophist does not deceive us when he praises what he *sells*, like the dealers wholesale or retail who sell the food of the body; for they praise indiscriminately all their goods, without knowing what are really beneficial or hurtful: neither do their customers know, with the exception of any trainer or physician who may happen to buy of them. In like manner those who carry about *the wares of knowledge,* and make the round of the cities, and *sell or retail them to any customer* who is in want of them, praise them all alike; though I should not wonder, my friend, if many of them were really ignorant of *their effect upon the soul;* and their *customers* equally ignorant, unless he who *buys* of them happens to be a *physician of the soul.* If, therefore, you have understanding of what is good and evil, you may safely *buy knowledge* of Protagoras or of any one; but if not, then, my friend, pause, and do not hazard your dearest interests at a game of chance.[10]

I have italicized the metaphorical uses of the terms. The metaphor's points of analogy may be mapped as follows in Table 2.

TABLE 2. The Teaching Is Commerce Metaphor with the Ideas Are Foods Specification of the Ideas Are Objects Mapping

Commerce of Foods (source domain)		Teaching (target domain)
food (objects)	→	ideas, knowledge, instructions
seller of foods	→	teacher
purchaser of foods	→	student
healthy food	→	ideas which do us good (true)
unhealthy food	→	ideas which do us harm (false)
physician (person with expertise in telling us which foods are good for us and which are not)	→	"physician of the soul" (person with expertise in telling us which ideas are good for us and which are not)

[10] Plato *Protagoras* 313c-314a. The root translated as knowledge here is *mathémata.*

So far the reasoning in this passage draws straightforwardly on the metaphorical mapping given. In particular, note the analogous reasoning necessary to discover who the "physician of the soul" is: A person with enough expertise to tell if the ideas (foods) are helpful or harmful to us. However, Socrates continues by using a second disanalogy in these metaphors to further challenge Hippocrates:

> For there is far greater peril in *buying knowledge* than in buying meat and drink: the one you purchase of the wholesale or retail dealer, and carry them away in other vessels, and before you receive them into the body as food, you may deposit them at home and call in any experienced friend who knows what is good to be eaten or drunken, and what not, and how much, and when; and then the danger of purchasing them is not so great. But you cannot *buy the wares of knowledge* and *carry them away* in another *vessel*; when you have *paid* for them you must *receive* them into the soul and go your way, either greatly *harmed* or greatly *benefited*; and therefore we should deliberate and take counsel with our elders; for we are still young--too young to determine such a matter.[11]

The disanalogy is that while the foods of the body are carried home in external vessels, the foods of the soul are necessarily carried home inside the "body of the mind." Since (and unlike with foods) Socrates presumes that ideas are consumed and assimilated as soon as they enter the mind, we have no opportunity to reject them. From this external/internal disparity Socrates draws his disanalogous conclusion that bad philosophy teachers are not simply *as dangerous* but *more dangerous* than the sellers of bad food. Hence, Hippocrates is in grave danger if he wishes to entrust the care of his soul to a Sophist.

This disanalogous metaphorical inference is diagrammed in Figure 2.

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[11] Plato *Protagoras* 314a-314b.

Commerce (of Foods) (source domain)	Teaching (target domain)
1) We purchase foods we think good to eat	1) We study ideas we think good to learn
2) Good foods make us healthy; bad foods make us ill	2) Good ideas make us happy and moral; bad ideas make us unhappy/immoral
3) We can carry those foods home either in our stomachs or in containers	3) *Unlike with foods, we must carry those ideas home in our minds
4) The containers for those foods are external to us	4) *Unlike with foods, that container (the mind) is internal to ourselves
5) With unfamiliar foods one can always consult a physician before consuming the food	5) *Unlike with foods, with unfamiliar ideas one cannot always consult an elder (or "physician of the soul") before consuming the idea
Therefore, the sellers of bad food are dangerous	*Therefore, the sellers of bad ideas (that is, bad teachers) are more dangerous than the sellers of bad foods

FIGURE 2. A Disanalogous Metaphoric Inference Based on the Teaching Is the Commerce of Ideas-foods Metaphor

What do these two pairs of disanalogical inferences suggest? Taken at face value and individually, the first suggests that wisdom (and philosophy)[12] are not studied for the same reasons as technical studies, while the second suggests that teachers of bad knowledge (*mathémata*) are more dangerous than sellers of bad foods. However, when taken together, and as emblematic of a pattern of reason in Socratic thought, these disanalogies suggest something more. Taken in this way they suggest that the love of wisdom and the technical pursuits are different kinds of things, and that the philosophical method shows us where two subjects differ in kind. At this early point in the dialogue Socrates has not yet

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[12] Again, Socrates has only spoken of wisdom (*sophia*) thus far, but it is instructive to see that his reasoning will influence the later conception of philosophy in the dialogue.

explicitly made the metaphysical move that there are such differences in kind, but he will make this move twice. The first time comes during the course of the argument when, just after Protagoras claims to teach *areté*, Socrates will pose this distinction in kind as an obstacle to the very possibility that Protagoras can actually be a teacher of *areté*. The second time Socrates makes this metaphysical move it is on a much grander scale and at the very end of the dialogue. Here Socrates will suggest that, although they have not gotten very far in answering the question of whether virtue is teachable or not, they have at least realized that first they must understand what kind of thing virtue is in itself.[13]

The Great Speech of Protagoras: How Changing Metaphors Changes Reasoning

When Socrates and Hippocrates first arrive at the house of Callias, they are still caught up in argument and pause to finish their discussion on the front patio before knocking. A surly servant who has undoubtedly overheard their discussion opens the door, sneers "More Sophists!" and slams the door in their faces. It is only after Socrates denies the charge that they are permitted to enter the house and witness the grandiose scene inside, complete with Protagoras leading his train of followers. The fact that they are almost denied ingress into the place of conversation is the first of several dramatic elements--Protagoras' lecture-in-motion, Sophists holding forth from all corners of the house, and so on--which all draw the reader's attention to the organization of space in the

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[13] Plato *Protagoras* 315a-315b.

dialogue.[14] Calling dramatic attention to the various spatial relations and perspectives implicit in the dialogue also serves to prefigure a change in metaphor, for just as Protagoras is guiding his train of followers he will shortly attempt to solve Socrates' objection by shifting the metaphors for teaching from Teaching Is Commerce in ideas to Teaching Is Guiding.

After pausing to take in the spectacle, Socrates and Hippocrates accost Protagoras and call a halt to the proceedings. This arrested motion is as doubly significant as the coincidence of Hippocrates' intellectual dawn with daybreak, for Socrates immediately begins to challenge the Protagorean conceptualization of teaching in the spatial metaphors of guiding and growth. Acting on Hippocrates' behalf, Socrates asks Protagoras what Hippocrates would learn if he should study with Protagoras. When Protagoras asserts that Hippocrates will come away a better person each day, and each day continue to grow and improve, Socrates refuses to accept this answer and tries to pin Protagoras down as to the particular subject in which Hippocrates will improve. Socrates presses the question much in the same way he did in the prologue with Hippocrates, using analogies to studying arts such as painting or flute-playing.[15] In attempting to pin Protagoras down to a statement about the subject he teaches, Socrates is preparing to spring the same trap, the same disanalogy, that first held Hippocrates in the prologue. Socrates wants to know in what subject Protagoras claims to possess expert knowledge so that he may ask whether it

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[14] Plato *Protagoras* 314c-316a.

[15] Plato *Protagoras* 318c.

is the kind of subject in which one finds experts.

Protagoras does claim to teach *areté* but he does not base his claim to being a teacher on being an expert in the sense Socrates has already developed. To some extent anticipating Socrates' distinction between the professional and philosophic arts, Protagoras initially claims that he only teaches his students the good management (*eubolia*) of their own affairs and in the affairs of the city, not the technical subjects (*technai*) in which the other Sophists train their students. It is Socrates who, in asking for clarification, refers to this subject as a technical subject, the art of politics (*politiké techné*).[16] Protagoras nonchalantly agrees, and their agreement gives Socrates the chance to introduce the distinction in kind between the technical professions and the liberal arts he and Hippocrates developed earlier. Socrates presents this distinction as what produces his doubt that there are any teachers at all of the art of politics and consequently of *areté*.

In response, Protagoras gives his Great Speech. This speech is intended to answer two Socratic objections[17] to the position that *areté* may be taught, both of which stem from the distinction in kind between the professional and the liberal arts arrived at in the course of the prologue. Socrates' first objection is: If civic virtue is teachable, then how can it be that the Athenians do not seem to consider it to be expert knowledge? As evidence, Socrates observes that the Athenians listen only to professional experts on

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[16] Plato *Protagoras* 318d-319a. In following the text closely, one sees that Protagoras does not adopt the term *techné* until after Socrates introduces it at 319a4, though he speaks disparagingly of the *technai* others force on their students at 318e2. He does however adopt the term at 322b5.

[17] *Plato* Protagoras 319a-320c.

professional matters (such as ship-building), but do not prevent any one from speaking on matters of government because the speaker does not have the requisite professional qualifications. The second objection is that some sons with excellent and virtuous fathers who gave them a good education in everything teachable did not become excellent. Socrates has known many excellent men of the city who seem unable to make either their relatives or anyone else better (unlike cobblers or other professionals who are able to teach their sons their trade). As good pupils do, Socrates has offered up the behavior and opinions of the many for Protagoras' accounting or rebuttal.

Protagoras' answer is, upon the consent of the audience,[18] initially takes the form of a creation story. The two titans, Epimetheus and Prometheus, are charged with the task of equipping all the mortal creatures with suitable powers, defenses, and the like. True to his name, Epimetheus (afterthought) uses up all the available powers and defenses on the brute animals, leaving human beings naked, unshod, unbedded, unarmed and unprovided for. When Prometheus (forethought) comes to review his brother's work at the last minute, he is at a loss as how to provide a means of salvation for the poor humans, so he steals for them fire from the forge of Hephaestus and Athena's skill in the arts. Thus equipped, human beings were able by the arts of practical wisdom (*entechné sophia*) they now possessed to invent clothing, bedding, houses, farming and shoemaking; and, by virtue of their (illegitimate) kinship to the gods, religion. But even as now provided for,

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[18] Plato *Protagoras* 320c. Plato here uses the dramatic elements to indicate that Socrates' does not to consent to this choice of form, but is rather shouted down by the audience.

humans are still on the razor's edge of survival. Although they have the elements of rationality, they still lack political wisdom.[19] Though they may live together in small groups for a while, they injure each other frequently and soon their communities fracture again. Although they have a share in the portion of the gods, what they possess in terms of the practical arts alone is not enough to provide human salvation; they remain in danger of extinction.

Two important considerations have already obtained at this early point in the parable: the practical arts (those subjects which lend themselves to the accumulation and transmission of expert knowledge) are something stolen from the gods, and this act of theft which Prometheus has undertaken on behalf of the fledgling humans has bound them to those gods. When Zeus sends Hermes to deliver the art of political wisdom to hapless humankind, it is because Zeus fears for their total destruction. But why should Zeus fear for humankind? Only because they are now kin to the gods, thanks to the Promethean theft. Thus when Hermes asks Zeus how he is to distribute this new art, Zeus decrees that all must have their share in political virtues. Without an aspiration to political wisdom located in every human being, city life is impossible; and those who refuse to exercise their capacity are to be put to death. Politics is not to be external to humankind; it is to become a part of their nature. Politics, we might say, is in the genes.

Protagoras' story of the genesis of humankind accounts for the distribution of

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[19] Protagoras is clearly making the same distinction as Socrates has earlier between teaching the wisdom of the technical arts and teaching the wisdom of the philosophical and political arts. Plato *Protagoras* 321c.

political virtue to all and offers a mythological explanation of why the Athenians allow anyone to speak on such matters. So far, however, he has not addressed how virtue can both be distributed to all and yet still be something which can be taught, let alone answered Socrates' second objection about why virtuous Athenian men do not necessarily produce virtuous sons, even though they presumably do their best to teach them civic virtue.[20]

In describing how virtue may be distributed to all but still requires instruction, Protagoras makes an enthymatic argument. First, he observes from experience that the Athenians do not rebuke or chide the ugly, dwarfish or weak, for those qualities are thought to be the results of nature or chance, yet they do correct each other on matters of civic virtue. Second, he observes from civic life that in the particular matter of law-breaking, a punishment is not inflicted as vengeance for the past act of transgression, but either as a lesson for the future so that the law-breaker does not transgress again, or else so that others witnessing the punishment are deterred from a similar transgression. To take such care in the correction of civic behavior and the deterrence of transgression is only sensible if civic virtue is something the Athenians believe to be teachable.

What Protagoras is driving at is that a distinction can be drawn between how the capacity for civic virtue is transmitted and how civic virtue is awakened and exercised to its fullest potential. To take a well-known example from contemporary science,

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[20] Socrates' objection revolving around the transmission of civic virtue from excellent fathers to their sons can now be seen as a clear challenge to the traditional genesis which Protagoras retells.

researchers who study songbirds have found that the capacity to sing a certain tune is genetically transmitted, but must be cued or awakened by hearing that tune sung by more mature members of its own species.[21] Similarly, the genetic explanation for the distribution of virtue speaks only to how the capacity for political virtue is transmitted between those who are kin, not to how virtue is epigenetically cued or exercised. For Protagoras civic virtue is not an object to be transmitted; instead, it is a capacity located in all Greeks which may be exercised, awakened, or guided forth. While the capacity for virtue may be natural, it must be nurtured and exercised if it is to reach its potential. These exercises may be taught, and the capacity developed thereby; the virtue therein may be recognized by the teacher and encouraged to express itself to its fullest potential, but becoming virtuous is a process requiring practice, not simply acquiring possession of the right *idea-objects*. The conclusion here is quite similar to that of Socrates and Hippocrates' first disanalogy. All agree that this sort of teaching is more like instruction in bodily form than instruction in the technical arts.

Protagoras uses precisely this sort of distinction to answer the second Socratic objection.[22] The genetic explanation may be true if it is the capacity which is inherited, not the exercise of the capacity. In this theory, the quality of the behavior of sons would be more closely linked to the success or failure of their moral instruction than to the quality of their genetic lineage. However, their genetic lineage--that they are kin to the

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[21] Gerald Edelman, *Bright Air, Brilliant Fire: On the Matter of Mind* (New York: Basic Books, 1992), pp. 42-49.

[22] Plato *Protagoras* 326e-327c.

Greeks, who are kin to the gods thanks to Prometheus--makes it certain that they have the capacity for civic virtue. Protagoras argues that the amount of potential in the capacity may vary, and thus just as in flute-playing there may be someone with a greater natural talent for virtue than another; but since all are instructed in civic virtue all the time, they are all better than those non-Greek barbarians who have never had occasion to have their natural capacities fostered, no matter how much potential their capacity for virtue may have contained. Just as good flute-players or sculptors may have sons without much potential for flute-playing or sculpting, so virtuous men may have sons without much potential for civic virtue. Though every effort be made to foster the capacity, the potential will limit its fruition; yet still all are better than those without any instruction whatsoever.

Thus, the strategy of Protagoras' answer to these objections is to effect a change in metaphor from Teaching Is Transmitting Objects (or teaching as a commerce of idea-objects) to Teaching Is Guiding. To restate them briefly, Socrates' two objections were: (1) How can anyone be a teacher of civic virtue, given that no one prevents non-experts from speaking on it? (2) Why does Protagoras claim to be a teacher of civic virtue, when Athenian men who have exhibited perhaps a higher potential for civic virtue than he have not been able to teach their own sons? Protagoras' response to both of these, when it is most directly put at the conclusion of his long speech, is that as "all are teachers of virtue to the best of their ability," "if we can find someone only a little better than the others at

advancing us on the way to virtue, we must be content."[23] Though he agrees that there are no experts who possess technical knowledge of civic virtue, there are teachers who can guide it forth.

Upon Protagoras' metaphor, the teacher of virtue is a guide to achieving civic virtue, not the source which transmits it. One teaches virtue when one recognizes it in others and calls it to their attention. Teaching virtue is different from performing virtuous acts, for the latter requires realizing the virtuous act implicit in oneself and one's situation, while the former requires recognizing and rhetorically exalting excellence in others. Protagoras' claim to being a teacher of civic virtue is based on well-developed moral eyesight, a result of travelling to many cities and living long enough to see and experience many moral problems from many perspectives. It is not, as Socrates proffered metaphor would suggest, based on his possession of moral truth and an ability to transmit it to others. Hence, Protagoras' claim is a claim to being an undisguised Sophist who can, like a poet, guide the souls of others through the careful attention to rhetoric. It is not a claim about being in possession of expert knowledge of virtue.

It is important to remember that although Protagoras' great speech was given as a direct response to Socrates' objections, its overall aim is answering Socrates' question as to whether Hippocrates should study with Protagoras. Though Socrates has his reservations about Hippocrates choosing to study with Protagoras, I have argued in my

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[23] Plato *Protagoras* 328a-328b. The phrase translated as "advancing us on the way to virtue" is *probibasai eis aretén.*

discussion of the prologue that those reservations stem from his use of the Teaching Is Commerce metaphor and the ensuing conceptualization of wisdom and the other civic virtues[24] as *idea-objects*. In contrast, Protagoras' claim to being a teacher of civic virtue draws on a different metaphor system, that of Teaching Is Guiding. In making his conclusion Protagoras metaphorically projects ordinary knowledge about what would make a good guide, and I have diagrammed that inference in Figure 3.

Guiding (source domain)	Teaching Areté (Civic Virtue) (target domain)
1) A guide is someone who has traveled to or near the destination before	1) A teacher of areté is someone who has demonstrated civic virtue before
2) The closer someone is or has been to a destination, the better they understand and can explain the terrain and obstacles involved in reaching that destination	2) The closer someone is or has been to being known as virtuous, the better they understand and can explain the problems and trials involved in becoming virtuous
3) The guide is someone who has been closer to a particular destination than most	3) Protagoras is someone who is said to be "farther along the road to virtue" than most
Therefore, Protagoras would make a good guide	Therefore, Protagoras would make a good teacher

FIGURE 3. A Metaphoric Inference Using the Teaching Is Guiding Metaphor

The answer to the question of why Hippocrates should come study with Protagoras is given by this straightforward analogical inference: Hippocrates should study with Protagoras because he is a well-traveled and experienced guide in matters both geographic and moral. Note the contrast between this example and the Socratic uses of metaphoric reasoning. Unlike those examples, Protagoras' inference does not depend on a

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[24] Wisdom (*sophia*) was one of the five traditional virtues. Socrates will shortly introduce the other four.

disanalogy.

Further Discussion of the Great Speech: Mapping the Teaching Is Guiding Metaphor

After Socrates poses the objections for him Protagoras' first response is to ask in which form to respond, either a *mythos* (story or parable) or a *logos* (reasoned argument). Protagoras' answer takes the form of a parable-cum-interpretation because it is as much a display of the method of using rhetoric to guide learning by changing the metaphors in which we think about a topic as it is a direct answer to Socrates' questioning. He uses various spatial analogies in the course of the speech that are coherent when viewed in the framework of the teacher as a guide for other travelers on a common journey. These spatial analogies are important in that evidence of his attempt to address Socrates' objections by establishing a Teaching Is Guiding metaphor.

For example, consider Protagoras' analogy between bent wood and children. To straighten bent wood, one applies force to straighten it out, as when one attaches guide lines to a young tree to straighten it out after it has been blown over by a windstorm, or as when one straightens a piece of bent lumber by wetting it, weighting it and allowing it to dry. Similarly, Protagoras suggests, the way to have children grow up to become virtuous is to encourage and admonish them toward virtue and away from vice. When a child is disobedient and strays off the path to virtue, Protagoras says the Athenians *straighten*

him with threats and beatings, as if he were a *warped and twisted plank*."[25] While we might find the advocation of corporal punishment questionable, the analogy of straightening is intelligible when understood in a framework of the Teaching Is Guiding metaphor.

A second spatial analogy Protagoras uses is the learning of writing:

> You know how, when children are not yet good at writing, the writing master traces *outlines* with the pencil before giving them the slate, and makes them *follow the lines as a guide* in their own writing; well, similarly the state sets up the laws, which are the inventions of good lawgivers of ancient times, and compels the citizens to rule and be ruled in accordance with them. Whoever *strays outside the lines*, it punishes, and the name given the punishment both among yourselves and in many other places is the correction, intimating that the penalty corrects or *guides*.[26]

In this passage the laws are conceived as patterns for the young to follow, and the fellow citizens are the writing masters who help train the young to stay within the bounds of the outlines that the writing masters have given them. Writing is another spatial motion analogy: Becoming virtuous is a matter of staying within the boundaries--or staying within the limits of the law.

These spatial analogies focus attention on the student's body as it travels through physical space and on the student's mind as it travels through mental space. The teacher is a person who guides the student in their movements through physical and mental space.

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[25] Plato *Protagoras* 325d. The phrases which indicate the analogy are translated as follows: "bent and warped wood (*xulon diastrephomenon kai kamptomenon*)", "straighten (*euthunousin*)."

[26] Plato *Protagoras* 326c-326e, emphases mine. I have omitted discussing another of Protagoras' spatial analogies here: teaching political virtue as teaching flute-playing (326b). His attention to balance, rhythm and the development of talent are the spatial elements in the flute-playing analogy.

The various virtues (justice, courage and so on) which someone who is virtuous presumably embodies are understood as physical forces compelling the travelers toward the destination. Notice that upon this conceptualization it is perfectly understandable to be caught between doing the just thing and the courageous thing, for example. Protagoras' (and his metaphor's) toleration of possible conflict between multiple ethical principles will prove a profound worry for Socrates later in the dialogue. The Teaching Is Guiding metaphor is mapped as follows in Table 3.

TABLE 3. The Teaching Is Guiding Metaphor

Guiding (Spatial Motion) (source domain)		Teaching Virtue/Excellence (target domain)
path or journey	→	a life
places along the path or journey	→	ideas
destination (a particular place)	→	idea of excellence/virtue
traveler	→	student
guide (another person on the journey)	→	a teacher
motion along the path to the destination	→	becoming virtuous
self-propelled motion	→	actions chosen by the student
pushes and pulls from other travelers	→	corrections, threats, beatings
physical forces compelling the travelers toward the destination	→	the particular virtues which help someone become excellent (justice, courage, etc.)

This mapping underlies not only this series of spatial analogies but the entire chain of reasoning by which Protagoras intends to dissolve Socrates' cautionary doubts about whether or not Hippocrates should pay Protagoras to teach him wisdom and make him virtuous. By drawing these spatial analogies in his parable, Protagoras shifts the

metaphors by which teaching is to be understood. Protagoras uses the shift in metaphor to return the focus of the dialogue to the student (and the student's educational journey). In doing so Protagoras has dismissed Socrates' question as to whether he is in fact a master of his subject matter (since he agrees that there are no experts or masters of it in the sense Socrates espouses). Instead, he has reinterpreted that question to ask whether or not he is acknowledged as being "further along the road to virtue" than his students (and thus a good guide for their journey). In all, Protagoras has made use of the shift in metaphor to move the focus of the dialogue from the object of study to the journey of the student.

The Ontogeny of the Socratic Method: Philosophy Versus Rhetoric

Quite unsurprisingly, Socrates is not satisfied with Protagoras' response. Socrates concludes his retelling of the great speech of Protagoras with an admiring yet barbed line: "Here Protagoras brought to an end his long and magnificent display of eloquence. For a long time I gazed at him spellbound, eager to catch any further word he might utter."[27] The barb is *spellbound*;[28] Protagoras' skill at rhetorical speechmaking is once again likened to powerful magic, capable of lulling even the keen philosophical senses of Socrates to sleep. Socrates rouses himself with an effort, and he thanks Hippocrates for

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[27] Plato *Protagoras* 328d.

[28] The Greek word translated as "spellbound" is *kekélémenos*, from *kéleo* "to bewitch, charm, or fascinate." Plato is again alluding to Gorgias' notion of the magical powers of rhetorical persuasion.

bringing him to hear Protagoras. In complimenting Protagoras Socrates says that he is nearly convinced, but if Protagoras will agree to answer one small question with a short answer, he will be convinced. Given such an appeal to his vanity, Protagoras has almost no choice but to consent; and whenever short answers are not forthcoming from Protagoras Socrates will return to this combination of appealing to Protagoras' vanity by turning to the audience and complimenting him on his limitless abilities.[29]

But why does Socrates insist on shifting the rhetorical form to a cross-examination (*elenchus*) consisting of short questions and short answers? Is it to trap Protagoras into a logical game of purely semantic distinctions, wherein he cannot answer without snaring himself in a Socratic contradiction? Or is it to keep Protagoras from being able to shift the metaphors back onto his own ground? When Protagoras protests that he is being misled by Socrates' questioning, Socrates offers to change places within the elenctic form and assume the role of the respondent. But Socrates does not give brief answers either; instead he adopts the Protagorean mode and gives his own great speech,[30] which runs on nearly as long as the great speech of Protagoras. Plato once again uses the dramatic elements of the dialogue to suggest that the question of rhetorical form and method are inextricably linked. As I will explain shortly, Socrates' conception of the philosophic method will rest on his appeal to the equalizing power of the art of measurement, and in his role as the defender of the dull and incapable of speechifying Socrates will propose a

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[29] See for instance Plato *Protagoras* 334c-338e, 348b.

[30] Plato *Protagoras* 342a-347a. This speech is clearly intended as a comic throwaway to the audience, with its overtures to the laconic brevity of those great intellectuals, the Spartans and the Cretins.

method by which every one might measure the quality of the rhetoric they encounter.

The game of short questions and short answers proceeds in large measure because Socrates wishes to keep Protagoras on a different metaphorical ground than the one Protagoras has used to resituate Socrates' concerns about Athenian behavior with respect to the proposition that civic virtue is teachable. As Socrates has framed the story in recounting his conversation with Hippocrates, to teach something requires that one be an expert in it--as the physician of the body is in respect to health and illness--for only experts possess the requisite expert knowledge of their subject matter to transmit it to others. Protagoras, however, has proposed a different understanding of teaching,[31] one which denies the role of physician of the soul and instead places the teacher and student on a common journey, and situates them both together as travelers on the road "on the road to civic virtue."[32] Socrates is determined to not let this understanding of teaching stand; but rather than attacking this shift in metaphor explicitly, he seeks to undermine the Protagorean position with a series of questions which treat civic virtue as an object, not as a destination.

The first sally of Socrates' questioning establishes that each of the parts of virtue is distinct from the other parts.[33] Observing that Protagoras seemed to be using many terms

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[31] Protagoras' theory of teaching applies not only to virtue. For instance, see Plato *Protagoras* 328a: "Thus as it is with virtue and *everything else*, so that if we can find someone only a little better than the others at advancing us on the way to virtue, we must be content."

[32] Plato *Protagoras* 328b.

[33] Plato *Protagoras* 329b-330b.

interchangeably, Socrates asks Protagoras whether justice (*dikaiosuné*), self-control (*sóphrosuné*) and holiness (*hosiotés*) are parts of one thing called *areté* (civic virtue); or all the terms simply names for the same thing? Protagoras responds that virtue is one whole, and justice, self-control and holiness are parts of it. Socrates next inquires whether Protagoras means "parts" in the sense of the material elements (in which all the parts are alike) or "parts" in the sense of the parts of a face (in which all the parts are not alike). Protagoras agrees that the parts differ from one another as do the parts of a face--the parts of virtue do not resemble one another. But he further states that the parts of virtue may be possessed individually and they are separable, unlike the parts of a face, for Protagoras notes that "many men are brave but unjust, and others are just but not wise."[34] Socrates seizes on this statement as offering an avenue for refutation, and courage and wisdom are added to the agreed-upon list of the parts of virtue, each part not resembling the other and each performing its own function. If Protagoras really believes that each part of virtue is distinct from each other and from the whole, then Socrates will soon show that the fork Protagoras has taken in the analogy has only ensnared Protagoras' account of virtue in contradictions.

The refutation begins with Socrates considering what sort of objects the different parts are. He asks Protagoras whether there is a some "object" (*pragma*) called justice, and when Protagoras agrees, whether the object called justice is *in itself* just or unjust. Protagoras agrees with Socrates' suggestion that in itself, or in its essential nature, justice

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[34] Plato *Protagoras* 325e.

must be just. Socrates proceeds similarly to establish the existence and nature of holiness in itself; Protagoras agrees that there is such a thing and that it must be by nature holy, thus falling into the first Socratic trap. Socrates then reminds Protagoras of his statement that the parts of virtue do not resemble one another, and the jaws of the trap spring: "Then it is not the nature of holiness to be just, not of justice to be holy; justice will be not-holy, and holiness not-just?"[35] Protagoras cannot agree with that and he backtracks on his statement that the parts of virtue do not resemble one another at all, but will argue that although there is a slight resemblance between them that does not make them indistinguishable. Sensing that he has sprung his trap too soon and Protagoras will not admit of the contradiction into which he has been led, Socrates backs off and tries another line of argument.

After the game of indirect argument continues[36] in a similar vein, Protagoras, perhaps sensing that he is unable to speak for himself in the mode of inquiry Socrates has brought him into, begins to distance himself from his answers and give only qualified responses. But then Socrates makes a curious statement: "It is the argument itself I wish to probe, though it may turn out that both I who question and you who answer are equally under scrutiny."[37] Is it, however, the same argument? Or has Socrates, like a good boxer, shifted his opponent so he is off-balance? And why does Plato have Socrates suggest that

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[35] Plato *Protagoras* 331a.

[36] Plato *Protagoras* 332a-333e.

[37] Plato *Protagoras* 333c.

they are both under scrutiny? Once again the return of the dramatic elements of the dialogue instruct the reader to take a critical distance from the text.

The argument Socrates is probing is not Protagoras' any longer, although Protagoras has consented to it. The metaphorical ground which Protagoras claimed in his great speech was that of Teaching Is Guiding; in this series of questions Socrates has claimed the ground of Teaching Is Transmitting Objects. In Socrates' questioning each of the parts of virtue (justice, holiness, and so on) are understood as if they were physical objects. When we consider these *idea-objects* in themselves they are considered to be "pure" in the same sense that a pure lump of gold is made of no other material; that is, neither admits of admixture with other materials or ideas. This was the metaphoric reasoning behind Socrates' first attempt to ensnare Protagoras in a contradiction; if justice *in itself* is *purely* (of a) just (material), it cannot be (of a) holy (material), and so the virtues must not be resembling (that is, have any material components in common). It is important to see that Socrates' line of questioning implies the individual virtues (justice and holiness etc.) cannot have their separate and autonomous existences--that is, the individual virtues cannot come into conflict with one another and at the same time remain parts of the whole object, virtue. The strategy of the entrapment is even more straightforward: If the opposing view leads one into a contradiction, then all the many names of the virtues must refer to the same one object. Thus the Protagorean account in which it might be possible (for example) for there to be a conflict between what it is just to do and what it is courageous to do appears to Socrates as impossibly laden with contradictions.

The shift in metaphor causes Protagoras to become caught up in contradictions as Socrates attempts to craft the various virtues into one single whole. After Socrates tells us that Protagoras has grown increasingly uncomfortable with the direction of the argument and the limitations of the rhetorical form of the cross-examination (*elenchus*) by questions and short answers, the attention to method is once again given dramatic emphasis. There follows a long interlude in which Socrates nearly walks out in a huff when Protagoras breaks into another speech, and subsequently Protagoras questions Socrates on poetry, which in turn prompts Socrates' great comedic speech about the wisdom of the Spartans. After this sarcastic interlude however, the duo finally return again to the matter and manner of Socratic inquiry into civic virtue. In the course of this questioning[38] it comes out that virtue is a single thing, knowledge, and all the parts--courage, justice, holiness, temperance, and wisdom--are also one thing, knowledge. Unlike in the Protagorean account, the parts of civic virtue must not be allowed to come into conflict in exercising their functions. In this account there should be no conflict of values, with justice pulling us in one direction and holiness in another; instead all the virtues should bring us to the same end, without conflict. And only somewhat uncharacteristically,[39] what does Socrates propose as that end? A life lived erotically through the senses: the avoidance of pain and the pursuit of pleasure.

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[38] Plato *Protagoras* 348c-360e.

[39] It is only somewhat uncharacteristic because pleasure will be shown to be the same as the good, and thus the proper object of knowledge and wisdom; hence Socrates as a teacher of philosophy, or the love of wisdom.

Pleasure and pain will ultimately prove to be the key to Socrates' next attempt to unifying all the virtues.[40] The first step is the equation of what is good with what is pleasant; Protagoras objects that only some pleasures are honorable and good, while others are dishonorable and evil, and yet others are neither good nor evil. To answer these objections Socrates asks Protagoras to consider whether the reason why some pleasures are evil is not that their pleasure is fleeting while their consequences painful, as in gluttony or lust. Protagoras agrees and Socrates asks him about the converse, that some current pains, such as physical training or a doctor's treatment, are done for the sake of something further, such as health, which is good. Protagoras again assents, and from this Socrates concludes that they are now agreed that the names for both phenomena are the same, pleasure and pain. Hence, Socrates says "if anyone objects that there is a difference between present pleasure and pleasure or pain in the future, I shall reply that the difference cannot be one of anything else but pleasure and pain."[41] The eventual implication is that differences can then be weighed, as when we consider indulging in present pleasures at the cost of future pains, and the action to choose is the action which will bring the most pleasure.

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[40] In the next brief round of conversation (Plato *Protagoras* 349a-351a) Socrates fails to convince Protagoras that courage, the virtue which Protagoras now claims least resembles the others, is knowledge, the most excellent of the virtues; as he did earlier he springs his first trap too soon and Protagoras manages to wriggle out of it. Socrates is forced to try again and this time he takes a broader approach, hoping to convince Protagoras that courage is the knowledge of a future good which outweighs knowledge of the present danger. The strategy will be to introduce a system of moral arithmetic in which courage equals the amount of future good minus amount of present danger.

[41] Plato *Protagoras* 356a.

One of the unvoiced assumptions is that pleasure and pain are measurable and can be divided into identical units. Future consequences are then commensurable with present action, each neatly quantifiable, and ethical deliberation proceeds according to a calculative rationality. Martha Nussbaum[42] remarks on the similarity of this thesis to the Benthamite calculus, and ironically observes that Socrates' suggestion is a radical proposal for the transformation of human life. She argues that if this measurement is to be Socrates' gift, then "like the other gifts mentioned by Protagoras, the science of measurement will enter into and reshape the nature and attachments of the being who receives it .... [and it would] restructure our attachments so that they are far less fragile,"[43] for all valued objects are valued in terms of a single, identical and quantifiable unit, pleasure. In these terms, the loss of one's lover to another would not be an irreplaceable loss because if one measure of pleasure in love (number it 10) is lost, it could be replaced by a like amount (10) of identical pleasure from a future consequence--perhaps in not having certain in-laws, or the acquisition of a new lover who brings an equal amount of pleasure. A uniform, single, measurable end--pleasure--would be substituted for the multiple ends and plurality of virtues engendered by Protagoras' account.[44]

The metaphors involved in this chain of reasoning are quite complex, and it is crucial to keep in mind the central mapping of the Teaching Is Transmitting Objects

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[42] Martha Nussbaum, *The Fragility of Goodness: Luck and Ethics in Greek Tragedy and Philosophy* (New York: Cambridge University Press, 1986), pp. 112-117.

[43] Nussbaum, *Fragility of Goodness*, p. 117.

[44] Nussbaum, *Fragility of Goodness*, p. 105.

metaphor; namely, that knowledge is composed of *idea-objects*. In my discussion of the prologue to the main dialogue I showed how the Teaching Is Commerce of idea-foods was a specification of the slightly more abstract Teaching Is Commerce of ideas-objects metaphor, and that the Teaching is Commerce metaphor was a specification of the even more general Teaching Is Transmitting Objects metaphor. Just as the ideas are foods specification was added to ideas are objects mapping of that metaphor during the process of narrowing down the scope of the argument with Hippocrates, for this argument the additional specification of foodstuffs will drop out of the metaphor in order to make possible Socrates' broader argument that philosophical inquiry is the art of considering (or weighing, or assessing) the objects of knowledge. Of course, Socrates is famous for opposing the notion that moral and philosophical teaching should be offered for pay, but seeing that this even more general level the metaphor does not even need to include the notion of commerce will prove important to understanding how his argument hangs together. The view of teaching here is that it is simply what it is in the large lecture hall: the transmission of objects of knowledge.

A mapping of this more general level of the Teaching Is Transmitting Objects metaphor follows in Table 4. I have given a tripartite mapping[45] in order to make this

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[45] The convention of a tripartite mapping is intended to explain how multiple metaphors can behind one another, with the target domain of the first serving as the source domain for a second metaphor. A similar example of a tripartite metaphor in the literature on metaphor can be found in Mark Johnson's Moral *Imagination*, p. 169. I have called this phenomena "chaining" in metaphor systems. Mark Turner calls this phenomena "recursive" conceptual blending (*The Literary Mind,* New York: Oxford University Press, 1996, p. 95). In the notation I have developed for chaining, this metaphor mapping would be written: (transmitting objects → teaching knowledge) → teaching virtue.

chain of reasoning as clearly as possible. With the addition of a third column I have tried to spell out exactly what this metaphor entails for a theory of teaching not just generally for knowledge but also specifically with respect to virtue. Because Socrates is arguing that virtue is a kind of knowledge (or idea), his system also conceptualizes acts of virtue as objects. Thus the third column represents what it means to teach virtue as if becoming virtuous were not merely the acquisition of knowledge, but the acquisition of objects of knowledge.

Once again it is worthwhile setting out the crucial passage in some detail in order

TABLE 4. Teaching Is Transmitting Objects, Where Virtue Is an Idea-object

Objects (Source Domain)	Ideas, Knowledge (Target Domain 1)	Virtue/Excellence (Target Domain 2)
desirable objects	→ ideas, true knowledge, knowledge of reality	→ virtuous/excellent acts, pleasure (acting uncommonly well)
undesirable objects (and the possession thereof)	→ opinion, appearance, "common knowledge"	→ vicious acts, pains (acting like a non-excellent commoner)
value attributed a desirable object	→ positive assessment of an idea	→ quantity of pleasure (weight of virtue-object)
value attributed to an undesirable object	→ negative assessment of an idea	→ quantity of pain (weight of virtue-object)
comparison of the value of objects	→ calculation, thinking	→ moral deliberation
possessor of desirable object	→ teacher of knowledge	→ moral expert, "physician of the soul"
transfer of desirable object	→ teaching of knowledge	→ teaching of virtue
recipient of desired object	→ student of knowledge	→ citizen
acquisition of desirable objects	→ education; the acquisition of appropriate knowledge	→ life; the acquisition of virtue or excellence

to analyze the intricacies of the metaphoric reasoning. The two basic points of this passage is that the virtuous (and vicious) acts are objects, and that one measures these objects according to a scale of pleasures and pains. The crux of the relevant passage begins as follows:

> [Socrates:] And do you, like a skillful weigher, put into the balance the pleasures and the pains, and *their nearness and distance*, and weigh them, and then say which outweighs the other? If you weigh pleasures against pleasures, you of course take the more and greater; or if you weigh pains against pains, you take the fewer and the less; or if pleasures against pains, then you choose that course of action in which the painful is exceeded by the pleasant, whether *the distant by the near* or *the near by the distant*; and you avoid that course of action in which the pleasant is exceeded by the painful. Would you not admit, my friends, that this is true? I am confident that they cannot deny this.

At the outset of this quotation Socrates makes the odd statement that one must put "nearness" and "distance" into the weighing pans along with the actions (the objects) as one goes about measuring the pains and pleasures of these objects. While it makes good sense to refer metonymically to the vicious *action-objects* which would be weighed as painful as "pains" (and similarly to virtuous *action-objects* as "pleasures"), how can "nearness" and "distance" be objects in the balance pan to be weighed and measured?

Explaining this oddity requires explaining how Socrates skillfully uses the Teaching Is Transmitting Objects in a way that coheres with two other conventional conceptual metaphors. The first of these metaphors is the use of spatial relations to understand to temporal structure, a Time Is Space metaphor. Times that are immediate or sooner are *nearer* to us, while those times which are later in future from the present are *more distant* from us. Given the context of the discussion, Socrates uses this metaphor to establish that

the pleasures and pains which are to be had at a more immediate time are nearer to us, while the pleasures and pains at a more future time are more distant to us.

After a brief pause in which Socrates merely reports that Protagoras grants him another entirely too complacent nod of assent, Socrates plunges ahead by introducing a second related conceptual metaphor: Knowing Is Seeing. In this metaphor, we project the patterns of reasoning we have learned about seeing onto the domain of knowledge. For example, when the visual medium is murky or unclear, we do not see well; hence, we cannot "see" (understand) what someone means when their writing is murky or unclear. Just as we need light to see the objects at which we are looking, we need reason to study the *idea-objects* which we wish to know.

Notice how this Knowing is Seeing metaphor coheres with all of the metaphors I have been setting out so far. In the mapping of Teaching Is Transmitting Objects metaphor I have given above, virtuous actions are a special kind of idea, and an idea is an object which can be manipulated by the teacher or the student. Using the generic conception of virtuous actions as *idea-objects,* Socrates proposes that moral deliberation is the *weighing* of actions. Now consider how both the Time Is Space and the Knowing Is Seeing metaphors can contribute to drawing a coherent picture of what is happening in moral deliberation: Just as we can *weigh* these *objects*, we can also *look* at such *objects* which are either *nearer* to us (i.e., at a immediately present time) or more *distant* from us (i.e., at future time). What makes this elaborate chain of reasoning possible is that all of these metaphors cohere around the common mapping "ideas are objects."

In this passage Socrates is reasoning by drawing this cluster of metaphors together. In the next step of the argument Socrates points out a problem with bodily sight which, in his characteristically inimitable fashion, provides the basis for another important disanalogical inference. When we see two objects of equal sizes which are placed both near and far, the one which is nearer appears to be smaller and the one which is further appears to be smaller:

> [Socrates:] Well then, I shall say, if you agree so far, be so good as to answer me a question: Do not the *same magnitudes appear larger to your sight when near*, and *smaller when at a distance*? They will acknowledge that. And the same holds of thickness and number; also sounds, which are in themselves equal, are greater when near, and lesser when at a distance. They will grant that also. [46]

Such an observation may seem trivial, but it is anything but trivial. When Socrates says that a skillful weigher puts "nearness and distance" into the balance and weighs them as well, what he means is that one must correct for perspectival illusions about the magnitude of such objects. Thus it is now possible to see how to make sense out of Socrates' odd turn of phrase in which he suggests putting "nearness" and "distance" into the balance pans along with the pleasures and pains. The knowledge gained through weighing (and, as the series of examples afterwards indicates, through measurement in general) is supposed to rectify any deceptive illusions of magnitude caused by the fact that bodily seeing is always done from a particular bodily perspective.

This Socratic disanalogy produces the insight that philosophical seeing is not the same as bodily seeing. The reason is that bodily sight is misleading when compared to

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[46] Plato *Protagoras* 356c-e.

what we can know through measurement. He argues that this disanalogy shows us one of the crucial ways in which knowing differs from that derived by bodily seeing:

> [Socrates:] Now suppose happiness to consist in doing or choosing the greater, and in not doing or in avoiding the less, what would be the saving principle of human life? *Would not the art of measuring be the saving principle; or would the power of appearance*? Is not the latter that deceiving art which makes us wander up and down and take the things at one time of which we repent at another, both in our actions and in our choice of things great and small? *But the art of measurement would do away with the effect of appearances*, and, *showing* the truth, would rather teach the soul at last to find rest in the truth, and would thus save our life.

The key to this argument is the term *appearance*. Because it is bound to a bodily perspective, bodily sight yields only appearances of the way things actually are, while measurement yields knowledge of things the way they really are. Considerations from any particular perspective, on Socrates' account, will not be particularly helpful to finding true knowledge--only systematic measurement will do.

At this point in my argument, it should be clear that Socrates' long discussion of measurement as a corrective for the effects of perspective on knowledge is a direct challenge to the relativism engendered by the metaphoric reasoning in Protagoras' Teaching Is Guiding metaphor. Understanding teaching as guiding highlights the importance of perspective to the teaching of civic virtue. As Protagoras claimed, what makes a good teacher is the same as what makes a good guide--having seen places (moral situations) from many perspectives and having a good memory for how the perspective on those places (moral situations) changed along the journey (during the course of life). Socrates however challenges this conclusion by means of a subtle yet palpable shift in the

metaphors used to characterize teaching and knowledge. While ostensibly considering the same question about whether perspective can be relied on to produce knowledge, Socrates replaces the Protagorean conceptualization of virtuous actions as destinations with one in which virtuous actions are idea-objects, and thereby produces a different set of metaphoric entailments. I have diagrammed this first metaphoric inference in Figure 4.

Guiding (source domain)	Teaching (target domain)
1) Traveling allows one to see places from many different perspectives	1) Studying much allows one to see ideas from many different perspectives
2) Seeing a place from many perspectives gives a one better knowledge of that place	2) Considering an idea from many perspectives gives one a better knowledge of that idea
Therefore, a good guide is one who has traveled much and been to many places	Therefore, a good teacher is one who has studied much and studied many ideas

FIGURE 4. A Metaphoric Inference Based on the Teaching Is Guiding Metaphor

In order to raise a challenge to this reasoning that perspective, Socrates shifts the metaphorical ground from understanding teaching as guiding to the cluster of metaphors which cohere around a mapping of ideas to objects. In diagramming this inference in Figure 5 I have tried to stay as close as possible to the argument of the three previous quotes, but I have inevitably tidied up the order of the argument and stated explicitly the implied premises. To briefly recapitulate the metaphors used in this chain of reasoning one final time. The passage begins with the mapping of actions to objects, and then immediately introduces the metaphors of weighing the pain and pleasures in these *action-objects* and the spatialization of time metaphor. These spatial expressions are somewhat

Weighing/Seeing Objects (source domains)	Teaching Ideas/Virtue (target domain)
1) There are objects we can manipulate and see	1) There are moral actions (the pleasures and pains) which are understood to be objects we can philosophically *manipulate* and *see*
2) We can measure those objects in terms of an evenly marked scale	2) We can measure those moral actions as if they were objects in terms of a scale of pleasure and pain
3) When we want to decide what objects to take, we measure those objects in order to choose the most desirable one (or combination)	3) When we morally deliberate, we *weigh* which action which brings the most pleasure, the least pain or the best mixture
4) Some of these objects are farther away than others and we cannot yet manipulate and measure them	4) Some of these actions have consequences that are *later* in future, and we cannot yet manipulate and *weigh* them
5) Objects that are farther away appear smaller than the nearer	5) Moral actions (the pains and pleasures) that are later in time appear smaller than if they were earlier in time
6) We can estimate the magnitude of distant objects in order to weigh them alongside what we have (note the interesting conflation of weight and size as both measurable here)	6) We can estimate the magnitude of the future consequences of actions as we weigh them (note the interesting conflation of weight and size as both measurable here)
7) So we must factor in the distance of an object and correct for apparent size distortions	7) So we must factor in the distance of an object and correct for *apparent* size distortions
8) Bodily seeing yields only the appearances of something at one time	8) *Unlike bodily seeing, philosophical *seeing* (knowing with foresight) does not yield appearances
Therefore, the "knowledge" from bodily seeing which relies on the appearances given by a particular bodily perspective are deceiving. We need a system for measuring assessing these appearance.	*Therefore, philosophic *seeing* (knowing with foresight) relies on the systematic measurement of ideas and moral actions and does away with the deceptive appearances of a particular bodily perspective

FIGURE 5. Socrates' Disanalogous Metaphoric Inference Based on the Cluster of Objectivity Metaphors (Teaching Is the Transmitting of Objects, Knowing is Seeing, and Time Is Space)

odd until it becomes clearer that Socrates is also thinking of the actions are also objects which can be philosophically "seen," and their sizes can be measured much in the same

way as moral *actions-objects* can be "weighed." Then, Socrates concludes by drawing an explicit disanalogy between knowledge yielded by the power of appearance (bodily seeing) and that yielded by the power of measurement (knowing). He concludes that we must do away with how things appear to us in order to reason philosophically.

The argument against the value of bodily seeing in producing knowledge is the key disanalogy that Socrates uses to argue against the conception of teacher as a guide who can acquaints the student with a new perspective on a moral situation because the teacher has experienced so many perspectives that he or she can appreciate the student's current moral dilemma and what will guide them out of it. Instead, what Socrates proposes here is instead teaching the student a method whereby their moral actions and their consequences are to be assessed objectively, without regard to the particular perspective.

Whenever he uses the guiding metaphor himself, Socrates uses this key disanalogy to constrain its entailments about the value of perspective. Normally, considering moral teaching using a guiding metaphor entails that is good to bring the student not to understand what the other possible perspectives on a moral situation might be, in the hope that providing the student with the experience will enable the student to handle present/future moral situations better. Such other perspectives might be not only be derived just from a different person's point of view, but they might also be situated in another culture, and/or they might be situated at another time. However, the Socratic conceptualizations of objective knowledge and objective moral knowledge are incompatible with this reasoning. As Socrates puts it, moral measurement has the power to "do away with the effect of appearance" altogether. When Socrates uses the metaphor

of Teaching Is Guiding, the disanalogy between knowing and seeing that denies the value of perspectival appearances overrides the conception of learning from experience implicit in the guiding metaphor.

Instead, Socratic and Platonic uses of the guiding metaphor are constrained by the conception of objective knowledge: the moral guide must lead the student along the path that will lead to an idealized philosophical perspective which sees all things as they really are. In the *Republic*, for example, Plato writes argues that it is the duty of the pedagog to lead the denizens of the cave into the outside world (the world of the "forms" or ideas) in which things are "seen truly" according to their natures.[47] Or to take another example: In the account of creation given in the *Timaeus*, Plato presents an elaborate cosmological theory explaining why it is so difficult to achieve this idealized philosophical perspective. The story runs as follows: Once the cosmos was moving in the direction of increasing order, and eventually it wound itself into a state of complete perfection; but it then began to fall apart again, moving in the direction we now experience it in. The movement in the first direction is the direction of causal explanation; the direction in which we now experience it moving is time. The arts of causal explanation, which seek to explain things philosophically according to their own internal natures, require thinking backwards against the flow of time. When successful, we can imagine--or more properly speaking, we would know--things as they must have looked from a standpoint which beheld the cosmos in its state of perfect order. That perspective is the idealized philosophical standpoint, and it is

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[47] Plato *Republic* 506e-520a.

the duty of the guide not to simply bring the student what time and experience would bring the student in any case (that is, more faulty perspectives), but instead to bring the student "backwards in time" to an idealized philosophical "perspective" from which it is possible to perceive immediately the objects of knowledge in themselves.[48] In the *Meno*, for example, this reversal of our normal understanding of time and the role of experience in guiding us yields the strange doctrine that knowing is *amaneusis*, or remembering knowledge that the soul has really "known" all along.[49] I will have more to say about this type of metaphysical hypothesis (an ideal standpoint from which one can see objective knowledge) when I turn to Aristotle, as Aristotle not only makes much of this metaphysics explicit but also explicitly excludes metaphor from philosophical knowing.

In terms of the present dialogue, however, Socrates' hope is that by shifting metaphors from teaching as guiding to the teaching of objective knowledge the young Athenians, like Hippocrates, will learn to adopt the more forethinking and systematic measurement of ideas. Armed with such a method of intellectual or moral mathematics, he hopes that they can avoid the need to traverse multiple perspectives in order to avoid mistaking the quality of ideas in intellectual life, or the quality of actions in moral life.[50] Near the very end of the dialogue Socrates tells Protagoras that he preferred Prometheus

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[48] Plato *Timaeus* 52e-53c.

[49] Plato *Meno* 81d.

[50] The intimation is that as all things will become commensurable with one another there will emerge some single perspective from which all things are knowable; however, that will have to wait for Aristotle to be formulated explicitly.

above all the other characters in Protagoras' great speech, because his name means "forethought." Socrates, of course, takes "forethought" as implying measurement. He proposes his method of analysis in the hopes of providing the average Athenian with a method whereby not only ideas but also rhetoric and the teachers of rhetoric might be assessed. If Protagoras' claim to being a teacher is based on being an experienced traveler (that is, on the Epimethean process of hindsight), then what Socrates is proposing is the substitution of a systematic analysis of civic virtue for years of experience with civic virtue.

This substitution of forethought for years of experience marks a change in both the rhetorical form and the argumentative method from Protagorean rhetoric to the Socratic elenchus. For Plato, this change in form and method from analogical metaphoric reasoning to disanalogical metaphoric reasoning is what distinguishes philosophy from rhetoric as a discipline. Just as ordinary metaphoric inferences were crucial to the Protagorean, Gorgian, and Heraclitean methods of philosophical inquiry, so disanalogical metaphoric inferences are crucial to the Socrates' elenchic method.

In distinguishing philosophy from rhetoric in this way, by defining philosophy in its ontogenesis as the art of measuring the good and evil brought to Athenian by the Sophist, Plato intends Socrates' gift to be a radically democratizing force--for after all, anyone can learn to measure. In his persona as a humble stonemason, Socrates often reminds us that he offers this gift in the hope that even those who are not gifted at speechmaking might become able to assess the content of the speeches made by those who are. In this political context, Socrates is teaching the Athenians how to be a peculiarly philosophical sort of

heckler, good at poking holes into the metaphors of the rhetoricians. Even so, the enterprise of seeking out disanalogies in metaphors remains fundamentally a metaphoric endeavor, and thus this method is also constituted by metaphoric reasoning (albeit disanalogical metaphoric reasoning).

Conclusion: Why Socrates' Theory of Teaching Implies a Certain Metaphysics

In this chapter I have been arguing a number of related important themes. Three of them concern Socrates' method of teaching philosophy. First, I have argued that Socrates is here committed to "thinking through" (in the sense of reasoning by using) the metaphor of Teaching Is Transmitting Objects and advocating that it is superior to the Protagorean alternative of Teaching Is Guiding. Second, I have argued that he is committed to "thinking through" (in the sense of critically examining) the metaphor of Teaching Is Transmitting Objects, and this critical examination of the metaphor and its entailments, both analogous and disanalogous, generates much of the philosophical controversy in the dialogue. Third, I have argued that Socrates' insistence on the rhetorical form of the *elenchus*, or method of cross-examination, is intended both to prevent Protagoras from shifting back into a Teaching Is Guiding metaphor and to demonstrate why ideas should be systematically measured as if they were objects. The philosophical method of the *elenchus* is developed as a counterweight which corrects for problems in the rhetorician's preferred metaphor in which understanding ideas are destinations to be reached by the student and teacher on a mutual journey. Taken

together, I would argue that these three themes constitute a peculiarly Socratic view of philosophical method, one which denies the importance of the subject's perspective (or perspectives) to knowledge (i.e., relativist epistemologies) in favor seeking to replace subjective perspective with a systematic measurement of ideas (objectivist epistemology).

A fourth important theme I have addressed is the relationship between perspectives on knowledge and contradicting oneself in Plato's view of teaching philosophy. Since a contradiction is not admissible in the systematic measurement of ideas, the goal of Socrates' philosophical method is to establish a single perspective from which all things can be known, or--since the talk of "a perspective on knowledge" is supposedly misleading--it is to achieve a system of perspective-less knowledge by rendering the contradictions engendered by multiple different perspectives commensurable. Although it is always controversial to claim to have separated Plato's voice from what he has Socrates say, I have argued that Plato's use of the dramatic and rhetorical elements of the dialogue encourages us to take a critical perspective on the Socratic view of philosophical method. In encouraging us to take up our own critical perspective on Socratic philosophy Plato, as the dramatist who philosophizes behind the scenes, teaches us to doubt and critically assess the possibility and the adequacy of the systematic assessment of ideas that he has his Socrates propose.

Nonetheless, Plato clearly uses those same dramatic elements to distinguish philosophy from rhetoric (the fifth theme of this chapter). This distinction is drawn both in terms of the form and of the content, and has implications both for how philosophy is to be taught and what philosophy is to teach. In terms of the form of philosophical teaching,

the philosophic method of the art of measuring--or of systematically assessing--ideas is proposed as a replacement for the paradoxical teaching style of the Presocratics and the Sophists. What was before a paradox or parable designed to perplex and intrigue the student to work through and resolve is now held to be a contradiction uttered by the teacher and indicative of a teacher's lack of competence. Naturally this distinction is disturbing to Protagoras and the other Sophists as it undermines their claims to being teachers of wisdom.

The implications of Plato's distinction between philosophy and rhetoric for the content of philosophical teaching are even more profoundly disturbing. If philosophy is to be the systematic assessment of ideas while rhetoric is simply how those ideas appear to us, then philosophy is to be the study of the *idea-objects* in themselves, or the study of the "natures of things." In other words, the content which philosophers are supposed to teach is to be knowledge of "things in themselves." Thus, at the conclusion of the dialogue, Socrates invites Protagoras into a new kind of conversation in which the object shall to discover what virtue itself is.[51] The dialogue thus serves to underscore a fundamental Platonic lesson: By knowing how the things in themselves are to be measured, the philosophers (and their students) can assess the quality of the speeches of the rhetoricians.

It is important to see that this move to discussing virtue itself not only marks a metaphysical turn, but that this metaphysical turn is itself brought about by means of metaphor. First, Socrates and Protagoras offered differing metaphors for teaching

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[51] Plato *Protagoras* 315a-315b.

wisdom. Second, these metaphors led to diametrically opposed entailments when reasoning about the value of perspective to knowledge. Third, Socrates' proposes that this opposition can be resolved by appealing to the manner of measurement by which we resolve perspectival illusions. However, I point out that this resolution shifts the focus of inquiry from the educational journey to the object of philosophical inquiry itself. Plato's metaphysics consists of precisely this kind of assessment of the objects of philosophy in themselves (e.g., virtue itself).

One disturbing thing about the metaphysical content which philosophers are now supposed to teach is how it constructs the identity of the student. The shift in focus from the student's journey to the objects themselves is intended to remove the illusions due to perspective and replace them with the truths of measurement, but in the quest for philosophical perspective free of the constraints of a particular bodily perspective it also removes the particularity of the bodily self (or subject) from the sphere of analysis. Plato's account thus presumes that the knowing subjects are completely interchangeable, save that they know how to measure the objects of philosophy.

The shift in metaphor produces not only a metaphysics but a conception of the method (or activity) of philosophy which is constituted by the metaphorical reasoning. The method of uncovering these metaphysical objects is philosophy, and it proceeds by critical reflection on metaphors, turning them into analogies and disanalogies. Plato takes this process of uncovering disanalogies, or differences between domains where the logic of reasoning by analogy fails, to reveal how and where the domains are independent of one another. Thus metaphorical reasoning generally, and in particular disanalogical reasoning,

is what constitutes the traditional philosophical conception of domain-independence. In his metaphysical hypotheses about the objectivity of knowledge, Plato suggests that the independence of these domains shows that they must be causally prior to our philosophical argumentation about what they are.[52] While Plato, working within the limits of the dramatic form, invariably presents these metaphysical hypotheses as the ideals to be sought after rather than as an expository reality in hand, this metaphysical tradition finds a fuller exposition and more explicit treatment in Aristotle.

In sum I have argued not only that metaphorical reasoning is constitutive of the philosophical reasoning in the *Protagoras*, but that the particular metaphor system which is espoused by Socrates implies a certain theory of teaching. In turn that theory of teaching implies a certain kind of metaphysics, which is the subject of the next chapter.

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[52] This suggestion has important implications not only for metaphysics but also for the philosophy of science. At bottom the debate over natural kinds in the philosophy of science is a debate over whether kinds (or in my language, domains) are linked via causation or necessity, or we in fact construct them as we seek to understand them.

CHAPTER III

TOWARD A WORLD WITHOUT JOINTS: NATURAL KINDS AND ANALOGY IN ARISTOTLE'S *POSTERIOR ANALYTICS*

> If you should not argue in metaphors, it is plain too that you should neither define by metaphors nor define what is said in metaphors; for then you will necessarily argue in metaphors.[1]
>
> Simplicio: But if Aristotle is to be abandoned, whom shall we have for a guide in philosophy? Suppose you name some author.
>
> Salviati: We need guides in forests and unknown lands, but on plains and in open places only the blind need guides. It is better for such people to stay at home, but anyone with eyes in their head and their wits about him could serve as a guide for them.[2]

Following Thomas Kuhn's publication of *The Structure of Scientific Revolution*,[3] the role of metaphor in scientific theorizing has been one of the most fertile areas in the philosophy of science. Most theorists agree that metaphor (and analogy, its close cousin) plays an important role in the construction of new theories, but philosophers of science differ over whether certain metaphors are *theory-constitutive*. Theory-constitutive

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[1] Aristotle *Posterior Analytics* 97b36-37. Translation from Jonathan Barnes, *Aristotle: Posterior Analytics* (New York: Oxford University Press, 1993), p. 68.

[2] Galileo, *Two Dialogues* (Berkeley: University of California Press, 1953), pp. 112-113.

[3] Thomas Kuhn, *The Structure of Scientific Revolutions*, 2nd ed. rev. (Chicago: University of Chicago Press, 1970).

metaphors are metaphors that give the organizational framework according to which the various theoretical particulars are arranged, related and categorized; candidates subject to this debate range from Bohr's Atom Is a Solar System metaphor to the contemporary Global Warming Is a Greenhouse Effect metaphor. Central to this debate is the question of whether or not there are natural kinds that are independent of our scientific categories and that our scientific categories aspire to match, a question neatly summarized in Plato's language about whether our theories "cleave nature at its joints."[4] Parallel to the metaphysical question of whether such natural kinds exist is an epistemological debate which, although it assumes that natural kinds do exist, questions whether we can have any "epistemic access" to natural kinds. Rather than arguing that natural kinds do not exist, the epistemological opponents of natural kinds argue that any attempt at identifying the natural kinds is already enmeshed in theoretical assumptions and theory-constitutive metaphors, and hence we do not have knowledge of or unmediated epistemic access to the natural kinds. Thus, the problem about natural kinds engenders philosophical questions that hinge upon whether scientific language can refer directly and whether metaphor obscures reference.

In this chapter I argue that the tendency of this debate[5] to see the issues raised by theory-constitutive metaphors as a philosophical problem about the *reference* relation

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[4] Plato *Statesman* 262b. See also the arguments in his *Sophist* 253d-253e.

[5] For an excellent example of this debate see Richard Boyd's "Metaphor and Theory Change: What Is 'Metaphor' a Metaphor for?" Thomas Kuhn's reply "Metaphor in Science," and Zenon Pylyshyn's reply "Metaphorical Imprecision and the 'Top-Down' Research Strategy." All three are found in Andrew Ortony's *Metaphor and Thought*, 2nd edn. (New York: Cambridge University Press, 1993).

between the terms for scientific categories and natural kinds is misguided. Many contemporary theorists take problems of reference to be primary because they accept Aristotle's injunction against the use of metaphor in science and philosophy. As Galileo's Salviati implies, it is sometimes necessary to abandon Aristotle and Aristotelian thinking as one would a poor guide. Just as seventeenth century Italian thinking did with astronomical models, the contemporary debate sometimes comes close to abandoning Aristotle's negative view of metaphor in science, but the failure to acknowledge the persistent presence of the Aristotelian tradition in shaping the debate leads philosophers to formulate the key issues incorrectly. Contemporary thinking about natural kinds unwittingly inherits Aristotle's injunction against the use of metaphor and analogy in scientific theorizing, an injunction that, as we shall see, is profoundly paradoxical given Aristotle's own usage of metaphor.[6]

This paradox is perhaps best introduced in terms of Aristotle's metaphysical distinction between "what is prior and better known" from the perspective of a student as the student learns a science and "what is logically and causally prior" from the perspective of the expert who already knows a science. In this view metaphors and analogies are appropriate in learning, but they are not appropriate in expert discourse. The reason Aristotle thinks this distinction to be true is simply put: metaphors and analogies are too powerful to be of use to the expert, as they engender false inferences as well as true ones.

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[6] Thus Pylyshyn in "Metaphorical Imprecision" concludes that "... explanation does not terminate with an appeal to metaphor ... *except* as these are clearly marked to be explanatory debts to repaid at a later time..." (p. 547).

For the student, however, the failure of the engendered inferences is a valuable tool for learning. This was precisely the point I made about Socrates' use of disanalogous metaphoric reasoning in the previous chapter on the *Protagoras*. One reasons with the metaphors and analogies as far as one can, but ultimately one can only push a metaphor so far before it yields an educative disanalogy. Hippocrates, for instance, is forced by Socrates to admit that studying with a Sophist would only teach him to be a Sophist, "if this case is at all like the others."[7] Points of disanalogy reveal the differences between domains, or, more to the point, the places where the *organization* of one domain of knowledge differs from another. From this realization it is a simple step to asking the expert how the domains might be organized *in themselves*, as opposed to one domain simply being organized in ways both like and unlike another domain. From the perspective of the expert, the rules of how domains are organized in themselves are not understood to be *metaphorical or analogical* rules, but rather to be *causal and logical* rules.[8] Considering a particular domain by itself supposedly reveals that its internal organization is structured by relations of causality and necessity, not merely similarity. As Aristotle thinks metaphors and analogies depend on relations of similarity, and similarities are the consequences of the causal and logical relations, he naturally thinks that metaphorical and analogical reasoning is only incidental to science and philosophy.

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[7] Plato *Protagoras* 312a.

[8] For Aristotle causality and logic are co-extensive, though this is not always the case for contemporary philosophers. Hence I will use the term "and/or" when I make the broadest claim about both the ancient and the contemporary work, while the contemporary work by itself merits an "or" and Aristotle's merits an "and."

Just as in the discussion of the *Protagoras*, what matters here is the perspective taken on the philosophy--a perspective given by where one stands in the community of knowers. One must choose whether to speak as an expert or as a student. Nonetheless, no one is an expert without first having been a student. Similarly, even on an Aristotelian view, nothing can be a scientific category without first having been a metaphor during the process of discovery. Given this background the paradox is simply put: Though metaphors were originally used to generate a system of science and philosophy, the system they have generated explicitly excludes the use of metaphor in the future practice of mature sciences and philosophies. This paradox amounts to a kind of hypocrisy. Aristotle is denying future generations the very tool he uses to create the system that enjoins subsequent philosophers and scientists not to use metaphor. Theory-constitutive metaphors are used by Aristotle in establishing what the structure of science is to be, but are forbidden to future expert practitioners as they explain and theorize. In short metaphors are used only once, as the categories are being established, and then they supposedly are no longer permitted. Another Galilean rebellion against Aristotle is needed; once again, theorists need to question explicitly the very metaphors that shape a system which still guides us by telling us not to use metaphors.

Role of this Chapter in the Overall Argument

As I mentioned in the first chapter of the dissertation, throughout these first three chapters on classical Greek philosophy I am tracing ontogenesis of the conventional view

that metaphors should not be used in philosophical inquiry and argumentation. In chapter one of the dissertation I showed how Presocratic philosophical inquiry used the rhetorical form of paradox, and how those paradoxes depended on conceptual metaphors for their insights. In chapter two I explained how Socratic philosophy reacted against the metaphoric reasoning of philosophy in the form of paradoxes by using disanalogical metaphoric reasoning to develop the *elenchus* as a new rhetorical form for philosophical inquiry. Supposedly, Socratic disanalogies were supposed to reveal not only the differences between domains but also that the proper subject for philosophical inquiry is the nature of the things themselves. I showed how the particular metaphors Socrates used to formulate this kind of philosophical inquiry led him to suggest certain metaphysical hypotheses about the objective and the disembodied character of knowledge.

In this third chapter of the dissertation I analyze Aristotle's explicit formulation of these metaphysical hypotheses about knowledge. As for Plato and Socrates, Aristotle's metaphysical formulation of knowledge is also intrinsically bound up with the normative question of what rhetorical form philosophical inquiry and argumentation is to take. I begin by discussing Aristotle's view that philosophical and scientific argumentation must be done in a purely expository form, taking up in particular his thesis that metaphor should be excluded from philosophical and scientific argumentation. He argues that in order to produce genuine objective knowledge, such explanations be purely must referential and not use explanations drawn from metaphors or analogies. Aristotle's argument is thus both analogous to and far more explicit than the Socratic argument that I analyzed in the previous chapter. Where Plato's Socrates repeatedly uses disanalogies to suggest that

things need to be considered on their own terms in order to be known, Aristotle explicitly develops a normative philosophical theory about the natures of the *things-in-themselves*, which he calls "natural kinds." Properly done, philosophical and scientific argumentation must refer to the causal and logical properties possessed by these natural kinds in and of themselves.

However I argue that, just as in the case of Socratic disanalogies in Plato, Aristotle's argument for pure exposition in (and the exclusion of metaphor from) philosophical inquiry depends on metaphoric reasoning. Once again I apply what I have called the strong version of constitutive claim: I explore how the *particular* metaphors Aristotle uses lead to the *particular* philosophical position he espouses. Ironically, those metaphors lead to his conceiving philosophical inquiry as necessarily excluding metaphor from philosophical inquiry. I thus argue that Aristotle's injunction against metaphor is caught in a vicious circle, as he does not give an argument against metaphor without using metaphoric reasoning to accomplish that argument. When I analyze Aristotle's formulation of how his metaphysical views are supposed to explain this circularity, I argue that they require envisioning knowledge using the same cluster of objectivity metaphors as did Plato and Socrates. Where Socrates and Plato made their metaphysical views in somewhat less explicit terms, Aristotle's explicitly enjoins us to look at things from an idealized philosophical perspective.

I conclude this third chapter (and this first half of the dissertation) by arguing that the metaphysical picture of objective knowledge is inadequate. I argue that a more adequate metaphysical picture will have to acknowledge that philosophical and scientific

theorizing is constituted by bodily metaphors. In the second half of the dissertation, I posit just such an alternative metaphysical picture and explore its consequences. In the fourth chapter of the dissertation, I will be exploring how John Dewey's account of the embodied mind produces a better view of knowledge. In the fifth chapter of the dissertation I argue that Dewey's metaphysical picture has important contributions to offer the contemporary research in the cognitive science on the role of metaphors in conceptualization. In the sixth chapter of the dissertation I assess the results of my exploration of this alternative metaphysical account with respect to the normative question of argumentative form, offering a rhetorical form drawn from contemporary work in the philosophy of cognitive science.

Outline of the Argument over the Posterior Analytics

My overall purpose in this argument is to argue that Aristotle's injunction against the use of metaphor in science and philosophy is caught in a circular paradox. The argument for this paradox proceeds as follows. First, Aristotle has famously argued against the use of metaphor in science: "clearly metaphors and metaphorical expressions are precluded in definition."[9] Further, he argues at the outset of book ii, chapter 17 of the *Posterior Analytics* that analogies are inadmissible in giving a scientific explanation. However, I will argue that his theory of how we arrive at the first principles in book two

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[9] Aristotle *Posterior Analytics* 97b35. Unless otherwise noted, all Aristotle citations are from Mure's translation in *The Basic Works of Aristotle*, R. McKeon, ed., (New York: Random House, 1941).

of chapter nineteen rests on the usage of what I term "recursive analogies." By a recursive analogy, I mean an analogy performed in series, where the output of the original analogy is iteratively taken as the input into the next analogy in the series. (I will explain this more fully in a subsequent section of this chapter.) I endeavor to show first that these recursive analogies constitute Aristotle's conception of the universals (that is, natural kinds). Second, these recursive analogies generate the very conception of natural kinds which in turn makes possible his distinction between metaphor and analogy. For Aristotle metaphors are improper uses of language which confuse the category boundaries by bringing together two different natural kinds, while analogies are carefully constructed comparisons that exploit incidental similarities produced by causal and logical necessities in two different natural kinds, but without confusing (that is improperly fusing) the two different natural kinds. In short, Aristotle thinks that in an analogy we keep the natural kinds properly distinct but in a metaphor we do not.

If, as I will argue, the distinction between analogy and metaphor does rest on the theory of natural kinds, and if that theory of natural kinds is itself constituted by recursive analogies, then Aristotle's argument is obviously circular. Hence, even on Aristotle's own terms, the distinction he makes between metaphor and analogy is dubious. As I have stayed as close as possible to Aristotle's terminology as I work through his arguments, I have called the reasoning patterns Aristotle uses in this text "recursive analogies." However, after rejecting his distinction between metaphor and analogy, I point out that these analogies are what I would normally call "recursive conceptual metaphors." I conclude that since Aristotle's theory of science depends on a metaphorical and analogical

conceptualization of natural kinds, his argument against the use of metaphor and analogy in explanation is self-defeating. In other words I will argue that Aristotle's injunction against the use of metaphors fails because metaphor and analogy are constitutive of the practice of scientific and philosophical argumentation, even as he argues the extreme view that metaphor and analogy are to be excluded from such argumentation.

It is important to see that the admission of metaphor and analogy into scientific explanation is revolutionary. To explain why requires a brief some background information on to three of the most salient similarities and differences between Aristotelian and contemporary thinking about scientific explanation. First, Aristotle's theory of scientific demonstration is closely tied to his theory of logical syllogisms. Science, properly done, is a set of axiomatic laws and theorems deduced from those axioms, as in Euclidean geometry. To give a proper demonstration of a particular something first requires discovering in which category (i.e., natural kind) it belongs. Then we explain its causal process in terms of a syllogism where the conclusion is hierarchically explained in terms of the properties that kind of thing inherits from the axioms and theorems which logically precede that kind. Second, Aristotle also argues that not only are the natural kinds arranged hierarchically, but the sciences are also organized hierarchically. For example both arithmetic and geometry are subsciences of mathematics, while optics, though it has some principles native to it, is a subscience that inherits principles both from geometry and the even more general science of

mathematics.[10] Thus for Aristotle scientific knowledge is ultimately supposed to be one unified hierarchical structure. Third, the obvious drawback to this model of hierarchically ordered axiomatic sciences is that it assumes it is possible to attain a master science for whose first principles that are completely certain.

All three of these characteristics of Aristotelian theory--the axiomatic character of science, the hierarchical unity of the sciences, and human access to universal indubitable first principles--are of course hotly contested areas of contemporary philosophy of science. For the purposes of this chapter however I will limit myself to arguing only that admitting metaphor and analogy (which Aristotle thought were at best the merely incidental characteristics of a properly causal and logical science) into scientific explanation runs counter to what Aristotle conceives as the very project of giving scientific explanation. Further, I will explore how this one Aristotelian problem is still reflected in the contemporary debates, as in the distinction made between the logics of discovery and explanation. But given these three characteristics of Aristotelian conception of science the problem I raise is doubly serious within the Aristotelian context, for if I show that metaphors and analogies are constitutive of the axioms of the master science in the hierarchy, then they would be inherited by all the subsciences. Thus I conclude that as

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[10] However, Aristotle is careful to state that this inheritance is limited to the extent of the principle which applies to the subordinate science's subject matter. In a contrasting view W. D. Ross argues in *Aristotle's Prior and Posterior Analytics* (New York: Oxford University Press, 1949, pp. 64-65) that Aristotle differs from Plato here in that he does not think that there is one master science containing all the first principles, and from which anything can be proven. Instead he thinks that Aristotle maintains each special science has its own first principles. However, I think that Ross overstates the case: Some first principles apply universally to all sciences, but as we move down the hierarchical tree subsciences (and their daughter sciences) acquire principles native to them. See Aristotle *Posterior Analytics* i. 10.

even on an Aristotelian view the sciences are constituted by metaphors, Aristotle's attempt to exclude metaphor from science fails.

Against Analogy: Overview

Aristotle's argument against the use of analogy in scientific reasoning (*apodeixis*) is a recurring theme throughout the *Posterior Analytics*, but most importantly in book two of chapter seventeen.[11] Aristotle is considering the problem of whether causes must be identical in every case of the effect, or whether an effect can be caused by one cause in one case and a different cause in another case. Aristotle thinks that the causes must always be identical whenever the effect is the same, although he acknowledges that we often make errors and offer an accidental property or a symptom as a cause. In particular, he argues that explanations by analogy often lead us to make this kind of error. Aristotle offers a dialectical proof of why analogy should be excluded from science, properly done, in the form of a *reductio ad impossible*. As this argument is rather intricate, it is worth giving a brief overview of the argument before delving into its detailed examples.

The argument begins by supposing that demonstrations did admit of arguments by analogy. Aristotle argues that analogy results from either a mistake in the appropriate level of analysis or hypergeneralization (homonymy), each of which are sins of imprecise speech. The first case--mistakes about the level of analysis--is unacceptable because

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[11] See also Aristotle *Posterior Analytics* 99a4-17 and also i. 5, ii. 13, ii. 14.

science is about demonstrating causes that are appropriately commensurate and universal in every case of the same effect, not about demonstrating causes that are true but because the cause is inherited from a superordinate science. Given Aristotle's conception of the hierarchical unity of the sciences, we might mistakenly offer a proof of something in optics when it would be more appropriately explained as something inherited from its mother science, geometry. Such an attempt at explanation, though true, is thus not properly an explanatory demonstration; if admitted as science, misidentifying the appropriate level of explanation would lead to a "meaningless" (as opposed to Aristotle's notion of "meaningful" or literally referring) science. The problem here is that the attempted explanation lacks the full scope of explanatory power to explain every effect it could, a power which it would have if the level of analysis were properly identified.

In the second case hypergeneralization also proves unacceptable on grounds of explanatory power. Although scientists might try to postulate a new kind for every analogous relationship, Aristotle argues that the very possibility of scientific explanation requires that they multiply kinds not on the basis of similarities but on the basis of necessities.[12] The substance of the objection is the same as in the previous case: To engage in hypergeneralization leads one to speak in meaningless generalities which do not explain anything. The problem here is that ordinary language is so much more powerful than scientific language. In ordinary language the same term may (homonymously) refer to more than one thing. In doing science however this might lead us astray, as we might

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[12] A principle later known as Ockham's razor.

fallaciously suppose there must exist a yet more general category which encompasses both of the things referred to in ordinary speech, creating it by means of an analogy between these two things. That fictitious, ad-hoc, invented category would then be defined by the presence of some single, hyper-abstract element common to both things. This process leads to several Aristotelian worries: First, if ad-hoc categorization were to be the response to every observed similarity, then the categories could conceivably overlap and not nest hierarchically, as Aristotle believes is proper in scientific explanations. Second, the similar features on which such an ad-hoc category is based might turn out to be derived from independent sources, in which case the proposed explanation would turn out to be superfluous. Third, an ad-hoc category based on a similarity could be so very narrowly defined as to only encompass a very small number of things (as few as two), so such ad-hoc categories would lack explanatory power by having an overly limited scope of application. These worries sum up a single problem: To invent a category for every similarity precludes the possibility of scientific explanation. Thus Aristotle concludes that scientific demonstrations by analogy are inadmissible because in both cases they lack explanatory power.

As the foregoing overview is too sketchy to be convincing without the background of examples on which he draws, I will now discuss the details of his examples. Aristotle briefly mentions two sets of examples in support of his contention that analogy leads to the twin problems of mistaken levels of analysis and hypergeneralization: the theorem of alternating proportionality and an analogy between the way in which the shades of colors resemble one another and the way in which figures are similar. The two sets of examples

are complementary to one another. After I discuss the examples in detail I will offer yet another summary of the argument against analogy.

The First Case Against Analogy: Mistakes in the Level of Analysis

The first example, that of alternating proportionality, primarily illustrates the problem of mistaking the appropriate level of explanation:

> Take the question why proportionals alternate. The cause when they are lines, and when they are numbers, is both different and identical; different in so far as lines are lines and not numbers, identical as involving a given determinate increment. In all proportionals this is so.[13]

I have illustrated this example in the Figure 6.

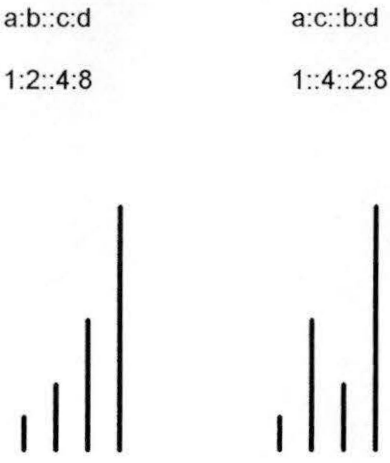

FIGURE 6. The General Form and Two Illustrations of the Theorem of Alternating Proportionality

The theorem of alternating proportionality states that the terms may be alternated without changing the fact that they are proportional, though the specific size of the

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[13] Aristotle *Posterior Analytics* 99a8-12.

proportionality (e.g. the doubling on the left side of the previous diagram, quadrupling on the right) in either case may change. Aristotle tells us that in the past there were two theorems of alternating proportionality, one for arithmetic and one for geometry. Aristotle's point is that it is a mistake to assume that because the two examples come from different domains of knowledge (lines and numbers), there are two different *kinds* of proportionality at work. While it is true that the explanation in the case of lines is analogous to the case of number, the explanations are only analogous because both geometry and arithmetic inherit the theorem of alternating proportionality from their mother science, mathematics.[14] Thus to explain alternating proportionality as a matter applying simply to lines or other geometric figures, or to explain it as a matter applying solely to number, or even to explain it as two different theorems applying to both fields but with the caveat that the two theorems are analogous to one another--these all are errors which mistake the appropriate level of generalization..

To give an explanation at a mistaken level of generalization is contrary to the practice of proper scientific explanation and leads one into equivocation. Aristotle remarks that as a matter of historical fact previous arithmeticians and geometricians spoke ambiguously of two analogous principles when now there is no need to speak ambiguously. Though the analogy between the two theorems is a valid one, it would be better simply to explain alternating proportionality in terms of a principle inherited from

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[14] See the account in the *Posterior Analytics* i. 5. It is clear that Aristotle is referring to a period in the past in which there was not yet a superordinate science which united both geometry and arithmetic.

the immediately superordinate science and modified just a bit to fit the daughter sciences. The reason why is that this explanation would be appropriately commensurate and universal because it would cover every case of the same cause and effect when formulated primarily at the proper level of analysis.

The Second Case Against Analogy: Hypergeneralization

The second set of examples primarily serves to illustrate the problem of hypergeneralization. As it rests on an analogy that is invalid, this example is rather more complex:

> Again, the cause of likeness between color and color is other than that between figure and figure; for "likeness" here is equivocal, meaning perhaps in the latter case equality of the ratios of the sides and equality of the angles, in the case of colors identity of the act of perceiving them, or something else of the sort.[15]

The analogy is between two kinds of "likeness:" that which binds two shades of a color together (the perceived qualitative similarity) and that which binds two figures together (that, is the equality of angles and equality of the ratio of the respective sides of the first figure to the sides of the second figure in, for example, similar triangles). In Figure 7 I have illustrated this both kinds of likeness using shades of grey for the color example and both similar rectangles and similar triangles for the examples of similar figures.

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[15] Aristotle *Posterior Analytics* 99a12-17. Also note that this same example is discussed at 97b31, just before Aristotle condemns the use of metaphor in scientific definition.

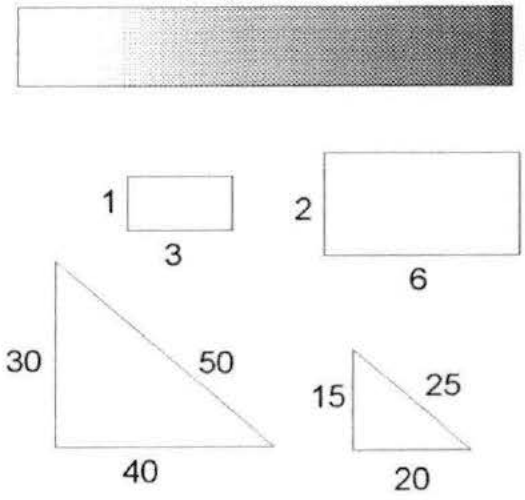

FIGURE 7. Aristotle's Examples of Hypergeneralization

Aristotle thinks that this comparison between the similarity of figures and the similarity involved in picking out colors that are other shades of the same color is an utterly absurd analogy--that is to say one about which we cannot use the term "likeness" here without equivocating. Surely, he argues, the term "likeness" is homonymous here. On one hand we have one kind of similarity, inductive reasoning about the perceived qualities of a color, and on the other another sort of thing, a rigidly defined geometric similarity based on proportional relations. Can we reasonably hope to discover that their explanations share a principle inherited from a superordinate science? Aristotle thinks not. He suggests that it is more likely that the ordinary use of the term "likeness" applies to multiple unrelated scientific categories, and thus the term's use in ordinary language is equivocal about its proper reference.

While the example of alternating proportionality is a valid analogy in virtue of the immediately shared superordinate, in this case Aristotle offers us a clear case of a bad

analogy to hammer home his point about hypergeneralization. While we might be tempted to think about how this example exhibits similarities by inventing a new, ad-hoc category to account for the proposed similarities, Aristotle believes that ad-hoc category formation creates more problems than it solves. In seeking a new level of analysis (or a new generalization) that covers both how colors resemble one another and how similar figures are similar, we risk being unable to explain anything at all. The reason is that the *practice* of generalizing whenever one encounters a new similarity is not a scientific practice. If we were to hypergeneralize in this way then there would never be reason to draw any category boundaries whatsoever and thus obtain any causes or explanations for a group of phenomena. One may only draw category boundaries in accordance with the necessary attributes. If one draws category boundaries to circumscribe phenomena on the basis of just any similarity, the categories and the explanations will multiply beyond necessity. Thus the upshot of Aristotle's argument about the dangers of hypergeneralization is to restrict the drawing of category boundaries to be done in accordance with only whatever criteria are (causally and logically) necessary.

Given that arguments by analogy raise this problem of equivocation both when we mistake the level of analysis and when we hypergeneralize, Aristotle concludes that explanation by analogy is contrary to the practice of scientific demonstration and must be excluded from it. Noticing analogy might play a limited role in the process of historical discovery (as in the case of alternating proportionality), but such accidental analogies must be justified independently before they can be scientifically known. Such justification proceeds using causal and logical criteria only.

Against Analogy: Summary

This argument is both so intricate and crucial to my project that it is worth summarizing once more. The logic of Aristotle's argument against permitting analogies in scientific demonstration may be summed up in seven steps:

1. Aristotle assumes that scientific demonstration by analogy is permissible.
2. This assumption leads to two related problems: mistakes in the level of analysis and hypergeneralization (homonymy).
3. His example of a mistaken level of generalization is that when we compare things across domains, such as the historical analogy between alternating proportionality in geometry and alternating proportionality in arithmetic, we want to say the cause is both the same and different. The two examples of alternating proportionality are "different in so far as lines are lines and not numbers, identical as involving a determinate increment".[16] Here, however, the error can be corrected by thinking about an immediately superordinate level of generalization that is a more appropriate location for a principle of alternating proportionality.
4. His example of homonymy likewise revolves about an analogy: first is the way in which the shades of a color resemble one another; they are all "alike" (identical) in the sense they all require the perception of a quality. Secondly,

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[16] Aristotle *Posterior Analytics* 99a31.

this alikeness between colors might be seen as analogous to the ways in which similar figures are "alike" in that all similar figures have "an equality of the ratios of the sides and equality of angles."[17] This is a prima-facie case of equivocation for Aristotle; surely we cannot mean the same thing by term "likeness" in our comparison given these examples. Thus, the term "likeness" must be radically homonymous here.

5. What is the relevant category for comparison in this second example? It is hard to see how the causes of these two different kinds of resemblance are at all identical without engaging in some radical ad-hoc category formation (i.e. hypergeneralization)
6. It is important for us to see that Aristotle regards the very idea of ad-hoc category formation as absurd (or at the minimum unscientific). To create categories in a willy-nilly, ad-hoc fashion is to equivocate about the cause. If we allow our science to equivocate, that would imply that there is no order in nature that can be explained scientifically. In other words, if we invent a new category for every observed similarity, we cannot explain anything at all. Allowing scientific demonstration by analogy would then contradict the very purpose of giving a demonstration.
7. (Conclusion) Obviously (3) and (6) show that explanations by analogy are not properly scientific, and so contradict (1). The problems with doing scientific

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[17] Aristotle *Posterior Analytics* 99a15.

> demonstrations that proceed by analogy is first that with good analogies one refers to one kind of thing with two different terms, and secondly that as bad analogies require the formation of a new category every time a single term refers to two different kinds of things, scientific demonstrations using such a term could never "carve nature at the joints" (i.e., scientific terms could never refer directly to their proper natural kinds).

What should be most striking by this point in my summary of Aristotle's argument is Aristotle's injunction against ad-hoc category formation. This injunction is highly suspect, given our twentieth-century beliefs about the experimental method's reliance on conjecture. If we take science to be tentative and revisable, the process of ad-hoc category formation is vital to the revision and development of scientific theories. This tension could be resolved, I think, in two ways: First, if the *Posterior Analytics* is an account of what scientific theory should be (as opposed an account of scientific practice) then the injunction against ad-hoc category formation is an injunction against analogy in the theory's final form (but not in the actual practice of how a science develops). This is precisely the reading of Aristotle's *Posterior Analytics* given by philosophers of science who make a distinction between the logic of discovery and the logic of justification. Such theorists maintain that the use of analogy is legitimate on the road up to knowledge (i.e. learning and discovery) but not on the road down from it (i.e. definition, explanation, and justification). Aristotle's own example of the discovery of alternating proportionality fits into this view well.

However, in the rest of this chapter I build a second argument which rests on the rejection of Aristotle's use of something like the distinction between the logics of discovery and justification to resolve this problem. I argue that Aristotle's arguments about the inadmissibility of analogy in science are both circular and vacuous given that his definition of natural kinds is itself made by analogy. From this vantage I argue that science does in fact proceed analogically, in theorizing as well as practice. Further I show why this undermines Aristotle's distinction between metaphor and analogy, and thereby reopens the question of what role metaphor plays in the formation of scientific theories. The account of the natural kinds I will consider appears in the final chapter of the *Posterior Analytics*. After explaining the problems in the ontological picture Aristotle draws for us, I will offer an alternative metaphysics in a subsequent chapter.

Why Aristotle's First Principles Rest on a Recursive Analogy

Aristotle's account in at the close of the *Posterior Analytics* of how we arrive at the first principles (*archai*) of science begins by pointing out that he has not explained the origin of pre-existent primary immediate premises, or basic truths, which cannot be the result of any demonstrations themselves but must spring from a different source. This source is an inherited capacity called *nous*, which yields not full-fledged demonstrative knowledge (as Plato has Socrates claim in the *Meno*) but rather a few self-evident premises that organize the perceptions, memories and experience acquired in the course of a human life. He gives a biological account of the origin of these premises that I have

outlined below:[18]

1. Animals have sense-perception.
2. Some animals have persisting sense perceptions.[19]
3. Some of the animals in (2) have a memory that systematically relates the persistent sense-impressions to one another.
4. Experience arises in some of the animals of (3)--that is, human beings--through the repetition of memories. Human experience is of that which "crosses" between memories.
5. From human experience springs the crafts or skills in coping with the world--these *techne* are a form of knowledge. They constitute the beginnings of human acquaintance with the rudimentary universals.
6. From human experience highly refined also come the *archai* (first principles) of science. These are knowledge of the "true" universals, as opposed to the rudimentary ones embodied in the crafts.

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[18] Aristotle *Posterior Analytics* 99b32-100a10. There is a long tradition of scholarly debate over (1) whether the following account concerns the concept-acquisition or the acquisition of universal principles and (2) the precise number of stages Aristotle identifies in this process at *Metaphysics* 985a5-17. On the more significant first point I follow Richard McKirahan in *Principles and Proofs: Aristotle's Theory of Demonstrative Science* (Princeton: Princeton University Press, pp. 240-44), who convincingly argues that the account of concept-acquisition shades into the account of the acquisition of universal principles; but for the contrasting view see Ross in his *Prior and Posterior Analytics* (p. 675), who makes a sharp separation between the two types of accounts. Though he follows Ross, Barnes' *Aristotle: Posterior Analytics* (pp. 260-5) has an overview of this controversy including the Platonic roots of this passage.

[19] Steps 2 and 3 (persistence and memory) are arguably collapsed into one stage in this process in the *Posterior Analytics*. Textual evidence summarized in Barnes' *Aristotle: Posterior Analytics*, (p. 261) suggests that Aristotle does not clearly set out any particular number of steps in this process. I have separated them for purposes of argumentative clarity in this presentation, as I do not think this dispute has much import for my argument.

7. Using this kind of story, Aristotle maintains that given the biological origin of science there must necessarily be a real identity between the categories of science and the kinds of creatures found in the biological world. Human beings are the animals with the capacity to know, and the categories of knowledge (or of rational science) are refined to be in accordance with the natural kinds existing in the world.[20]

What is particularly important here is that rather than being an exclusively ontogenetic or developmental account of how an individual human being comes to know the first principles, this passage is a account of how *human beings as a species* come to have the capacity for first principles, and this is given as a biological story. While from our late twentieth-century perspective we might characterize this as an evolutionary story, it is not an evolutionary story in a Darwinian sense. The reason is that Aristotle has a theory of fixed and universal natural kinds rather than a theory of dynamic and adaptive natural kinds.

The account is, however, a story that emphasizes the continuity of human rationality with biological nature in two important senses. First, human intelligence (by which I mean *nous* together with *techne*) emerges from the continuum of life (although in his hubris he posits humans at the top of the continuum). Second, there is a continuity

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[20] In *Philosophy in the Flesh* (New York: Basic Books, forthcoming 1998, ch. 7, p. 1) George Lakoff and Mark Johnson make this same point, saying "Aristotle ... saw an identity between ideas in the mind and the essences of things in the world. That identity answered the problem of knowledge. Aristotle concluded that we could know because our minds could directly grasp the essences of things in the world. This was ultimate 'metaphysical realism.' There was no split between ontology (what there is) and epistemology (what you could know), because the mind was in direct touch with the world."

between human categorization and animal perception; our knowledge of the universals is a refinement of perception. Aristotle states this origin of *nous* directly: "We conclude that these states of knowledge are neither innate in a determinate form nor developed from other higher states of knowledge, but from sense perception."[21]

All human categorization is thus intimately bound up with biology in that it has its origins in sense perception, but this intimacy extends even further. Aristotle believes that although "the act of perception is of the particular, its content is universal--is man, for example, not the man Callias."[22] In other words one perceives not a particular man, Callias, but the kind to which Callias belongs. That nature is intelligible to us--that scientific categories can "refer" perfectly to the natural kinds in the world--is thus true in virtue of the biological origin of the capacity for knowledge in sense perception. In fact it is so true that this relationship between categories and kinds is not really a referential relationship, but rather an ontologically guaranteed identity relationship.[23]

In arguing for the existence of a biological *capacity* as the origin of how we can come to grasp the first principles, Aristotle has not yet fully explained how the first principles *themselves* come to be. His account of how this process works[24] rests on what I term a "recursive analogy." In a recursive analogy, a traditional analogy is first

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[21] Aristotle *Posterior Analytics* 100a9-10.

[22] Aristotle *Posterior Analytics* 100a16.

[23] This guarantee would seem to pose a problem for how error would ever occur, but the ontological guarantee extends only to the capacity for true knowledge, not its actual realization.

[24] Aristotle *Posterior Analytics* 100a10-100b14.

established, then it is embedded inside a second analogy that compares again the target to the source--but a source which is now the similarity relationship of the entire previous analogy. This process is carried out in multiple iterations, in each of which the "output" of the previous step--the last step's analogy--is taken as "input" into the next step. This peculiar "feeding on itself" structure is the distinctive mark of recursion. Aristotle establishes the analogy just after concluding that human intelligence arises from sensory perception:

> It [the emergence of *nous*] is like a rout in battle stopped by first one man making a stand and then another, until the original formation has been restored. The soul is so constituted as to be capable of this process.[25]

Human beings are constituted in such a way as to be capable of knowledge; i.e., it is our nature to know. Aristotle analogizes human nature to recovering from fighting a losing battle: the emergence of *nous* is compared to how an army reforms after a rout. The extended analogy is mapped in Table 5.

In the rout all sense experience is chaotic, but when one soldier stands (i.e., when a sense perception persists) an animal learns to discriminate just a little bit and gains an edge in the rout. When other soldiers see this stand and are so inspired to stand themselves (i.e. other perceptions persist as well), the animal develops a memory. As groups of soldiers (i.e. memories) are gathered together into a coherent resistance, the animals have experience and at this stage they become specifically human. Finally, as the coherent resistance (i.e. experience) is marshaled by planning and forethought, a strong formation in

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[25] Aristotle *Posterior Analytics* 100a10.

TABLE 5. The Knowing Is Recovering From a Rout in Battle Metaphor

Recovering from a Rout in Battle (Source Domain)		Knowing or the Emergence of *Nous* (Target Domain)
rout	→	chaotic sense experiences
soldier	→	particular perception (sense experience)
standing and fighting	→	persistence of sense experience
first soldier to stand ground	→	first persistence sense experience
multiple successive standings	→	memory of sense experiences
coherent formation	→	human experience
original formation restored	→	science/philosophy (knowledge of universals)

battle is restored.

At this point human beings articulate again the *archai* of the arts, sciences and philosophy. It is important to see that for Aristotle it is the same original formation which is restored, and not simply another strong formation, for the first principles do not change. Of course some redistribution of the particulars among the various daughter sciences may be necessary and the restored formation would not be precisely identical in every detail, but for Aristotle the principles of organization do not differ and hence the original formation is for the most part inevitably restored. Further, it may also help to see that recovering this original formation refers to a process of ontogenetic as well as phylogenetic development. Just as Aristotle thinks the human species has to rebuild again the sciences whenever war seriously damages civilized life, developing individual members of the species are trying to realize the knowledge of the first principles that the adult

individual possesses.[26]

Having established the initial analogy, Aristotle proceeds to explain how first principles come to be by repeatedly iterating the analogy. Consider the following passage:

> Let us now restate the account given already, though with insufficient clearness. When one of a number of logically indiscriminable particulars has made a stand, the earliest universal is present in the soul: for though the act of sense-perception is of the particular, its content is universal--is man, for example, not the man Callias. A fresh stand is made among these rudimentary universals, and the process does not cease until the indivisible concepts, the true universals, are established: e.g. such and such a species of animal is a step towards the genus animal, which by the same process is a step towards a further generalization.[27]

The earlier instance of the analogy was straightforward: the particulars make a stand, just as the first soldier in a rout who stands to fight does. To restate some of the mappings of the earlier extended analogy in the Aristotelian *a* is to *b* as *c* is to *d* form:

> sense-perceptions are to a persistent particular perception what the chaos of a rout is to the first soldier in a battle to stand and fight

This restatement of the analogy may be schematized as follows:

> *a:b::c:d*
> where *a* is "sense perceptions"
> *b* is "a persistent particular perception"
> *c* is "the chaos of a rout"
> *d* is "the first man in a battle to stand and fight"

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[26] This is my rational reconstruction from what I take to be the structure of the argument, but it is important to note that there is an underlying textual controversy about whether Aristotle used *arche* (original) or *alke* (strength) to describe the restored formation. For further commentary see Barnes *Aristotle: Posterior Analytics,* p. 265 and McKirahan *Principles and Proofs,* pp. 244, 303-304. I follow McKirahan and the bulk of the manuscripts as I find the return to an original formation entirely imaginable, unlike Barnes. In any case, Aristotle's account here probably owes much to Plato's account of the present time as being a decay from the perfect original order of the cosmos, given as the creation myth in Plato's *Timaeus* 29e-92c.

[27] Aristotle *Posterior Analytics* 100a14-100b4.

This earlier example was only an explanation of the formation of general concepts, not of universal principles. However, the process of coming to know the universals is also a process of refinement that is characterized by this analogy, but with the significant addition that coming to know the universals requires applying that process of refinement repeatedly and successively. In each successive iteration the analogy partially replicates itself to build up another emergent level of organization until the universal principles are formulated. Aristotle's theory of the co-evolution of biology and rational capacities is thus simultaneously also a theory of the evolution of the sciences.

When Aristotle begins this passage by noting that the universal is present (albeit in a rudimentary form) even as the first particular makes its stand, he is giving the first iteration of the analogy. In iterating the analogy, he compares the relationship between the first persistent sense perceptions and the rudimentary universals to the entire previous analogy about the chaos of the rout of sense perception giving way to the first perception (soldier) that persisted (i.e., stood and fought). I restate this entire redoubled analogy more explicitly again:

> persistent particular sense perceptions are to rudimentary universals as
> the chaos of the rout of sense perception was to the first particular soldier-perception to persist, stand and fight

What is most important to see in this example is that the first analogy has its terms blended together (the chaos of the sense perception-rout and the first particular soldier-perception) as it serves as the analogy for the second. This iteration of the analogy could be unpacked as follows, using the addition of parentheses to indicate an order of operations:

> persistent particular sense perceptions are to rudimentary universals as
> (sense perceptions were to persistent particular perceptions as the chaos of a rout
> was to the first soldier to stand and fight)

This statement also may be schematized in a similar fashion to the previous one:

> *b:e::(a:b::c:d)*
> where *a* is "sense perceptions"
> *b* is "a persistent particular perception"
> *c* is "the chaos of a rout"
> *d* is "the first man in a battle to stand and fight"
> *e* is "rudimentary universals"

Note that the similarity relationship that underlies *the entire previous analogy* is taken as the point of comparison to that between persistent particular sense perceptions and the rudimentary universals, but done twice. If we think of the analogy as a mathematical function, the output of the previous function would be taken as input to the next iteration of that function.[28]

Further evidence for my hypothesis that Aristotle is using recursive analogy to explain how we come to know the first principles comes from the next step in Aristotle's account of how a fresh stand is then made among these rudimentary universals. Naturally it is becoming cumbersome to state each of the multiple levels of the analogy at the same time, but the relationship can be put more concisely. Barnes phrases it: "just as the different impressions of the "primitive" universal rallied until that universal made a stand, so now the different "primitive" universals will rally until the secondary universal can

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[28] It might be helpful to consider an arithmetic version of the analogy. If the output of the original analogy was the doubling rule (1:2::2:4), the first iteration of that analogy (performing it upon itself) would yield the redoubling rule 2:8::(1:2::2:4)(1:2::2:4), or 2 is to 8 as the doubling rule is when applied twice in succession.

make a stand."[29] An unpacking of this further iteration looks like so:

> rudimentary universals are to the next level of universalization as
> (persistent particular sense perceptions were to rudimentary universals as
> (sense perceptions were to persistent particular perceptions what the chaos of a rout is to the first soldier to stand and fight))

One could schematize this lengthy analogy as:

> *e:f::(b:e::(a:b::c:d))*
> where *a, b, c, d,* and *e* are from the previous example
> *f* is "the next level of universal"

What is of particular interest is that here the evolutionary account of biological creatures serves as the metaphorical basis for the evolutionary refinement of science.

I think, at this point, where "a fresh stand is made among these rudimentary universals,"[30] we have enough evidence to see that Aristotle uses a recursive analogy to characterize the process of how we come to have knowledge of universals. As Aristotle himself continues, "This process does not cease until the indivisible concepts, the true universals, are established."[31] The entire process can be explained recursively as follows:

> the true universals are to .... [i.e. the intermediate series of analogies] as
> (rudimentary universals are to the next level of universalization as
> (particular persistent sense-perceptions are to rudimentary universals as
> (sense perceptions are to persistent particular perceptions what the chaos of a rout is to the first man in a battle to stand and fight)))

And it may be symbolized as:

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[29] Barnes, *Aristotle: Posterior Analytics,* p. 266.

[30] Aristotle *Posterior Analytics* 100b1-2.

[31] Aristotle *Posterior Analytics* 100b3-4.

z:...::(e:f::(b:e::(a:b::c:d)))
where *a, b, c, d, e* and *f* are from the previous example
z is "the true universal"
... is "the intermediate series of analogies", that is, the iterative process

With each iteration science and scientific categories are refined, until the true universals are reached. The entire process is recursive when viewed from the perspective of the expert who seeks to start from the universals and explain how to arrive at the particulars; it is iterative when viewed from the perspective of the learner who starts from sense experience and moves upward. This recursive analogy constitutes Aristotelian *epagoge* (induction), and it takes place in the soul of a creature biologically constituted to be capable of this process--that is, the one with the capacity for *nous*.

It is important to note, however, that despite my symbolism suggesting that Aristotle would consider the iterative processes infinite, Aristotle clearly does not accept infinite proofs.[32] The process must have a finite number of steps to it. Thus there is a determinate story about the universals in science which necessarily must be fixed, true and final. The first principles are then those true universals which "come to rest in the soul"[33] by means of traversing this recursive analogy. These true universals are the natural kinds to which science ultimately refers.

However, the theory of natural kinds constituted by this recursive analogy

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[32] Aristotle *Posterior Analytics* 72b4-73a20.

[33] Aristotle *Posterior Analytics* 100a3. This translation follows W. D. Ross in *Prior and Posterior Analytics,* p. 674. Mure translates this same phrase as "the universal now stabilized in its entirety in the soul."

overturns Aristotle's distinction between analogy and metaphor, namely that metaphors are comparisons between unlike kinds that blur category boundaries while analogies (though also comparisons between unlike kinds) preserve the category boundaries. If analogies require a conception natural kinds to distinguish them from metaphor, and yet the natural kinds have their origin in a recursive analogy, the circularity of Aristotle's argument is obvious. On one hand the natural kinds would have to be prior to analogy in order for the distinction between metaphor and analogy to be made, while on the other hand analogy would have to be prior to the natural kinds in order for the theory of natural kinds to be made. Arguing that natural kinds are constituted by an analogy is equivalent to removing the basis on which the distinction between metaphor and analogy was made. Thus it is just as reasonable to suggest the theory of natural kinds is metaphorically based as it is analogically based. Given Aristotle's banishment of metaphor from definition at 97b37 and his argument that explanations by analogy lack explanatory power, this not only analogical but now also metaphorical definition of the natural kinds is inconsistent.

Resolving the Paradox: Why We Should Abandon the Aristotelian Metaphysics

By now it should be clear that Aristotle is caught in a circular paradox. If the argument against analogy depends on a theory of natural kinds, but the theory of natural kinds is itself constituted by a recursive analogy, then we must ask whether Aristotle's

circle is in fact vicious. As mentioned before, theorists[34] who maintain that it is acceptable to admit analogy and possibly even metaphor on the "road up" to the first principles (i.e. learning and discovery) though not on the "road down" from the first principles (i.e. explanation and justification), see this circularity as benign rather than vicious. The role of analogies and metaphors here is supposed to be very limited however: Analogies can play roles in the logic of discovery and as students learn, while metaphors play roles in generating theoretical views. However these roles are only to be permitted when a science is immature and has not yet developed a full-fledged logic of justification (or when a scientist is still learning--and hence immature--and not yet an expert). As should be obvious from the direction of the argument thus far, I do not think the distinction between the logics of discovery and justification can rescue the Aristotelian model from the circular paradox I have indicated.

To a substantial extent Aristotle himself foresaw this circular paradox and the contemporary solution to it. Consider again his distinction between "prior and better known to us" and "prior and better known in the order of being" (temporal and logical priority):

> The premises must be the causes of the conclusion, better known than it, and prior to it; its causes, since we possess scientific knowledge of a thing only when we know its cause; prior, in order to be causes; antecedently known, this antecedent knowledge being not our mere understanding of the meaning, but knowledge of the fact as well. Now "prior" and "better known" are ambiguous terms, for there

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[34] In the contemporary debate Pylyshyn makes precisely this kind of distinction between learning and explanation: "One must distinguish between the general programmatic enterprise of trying to illuminate a new phenomena and the much more demanding goal of establishing the validity of a theoretical principle" ("Metaphorical Imprecision," p. 547).

> is a difference between what is prior and better known in the order of being and what is prior and better known to man. I mean that *objects nearer* to sense are prior and better known to man; *objects* without qualification prior and better known are those *further* from sense. Now the most universal causes are *furthest* from sense and particular causes are *nearest* to sense, and they are thus exactly opposed to one another.[35]

If we grant Aristotle the distinction between things as they are known to us and things as they are known from the vantage point of all knowledge, then the circularity about natural kinds and analogy disappears--it dissolves into a mere figure-ground relationship. Analogy takes precedence over natural kinds in the genesis of science and natural kinds take precedence over analogy in scientific demonstration. Analogy is better known to us, but natural kinds are what we know best from the standpoint of being itself. Put in contemporary terms, metaphors and analogies are what generate a science during the logic of discovery but carefully fixed referential language is what characterizes projects in the logic of justification when a science is fully mature. Aristotle might put it bluntly: The apparent circularity is only a circularity if we vacillate about where we stand. Are philosophers to speak as experts or as students?

I am as suspicious of this proposed metaphysical transition from temporal to a logical perspective as I am of the "miracle" of transubstantiation. In neither case does one kind of being actually become transformed into another kind of being. A science once constituted by analogy and metaphor does not become a science without analogy and metaphor when "fully mature." Simply wishing any analogies away does not make them

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[35] Aristotle *Posterior Analytics* 71b30-72a5.

disappear; indeed, if those analogies are constitutive of science in its genesis, then the practice of scientific explanation is explanation using the carefully refined analogies which remain in science. The distinction between the logics of discovery and justification cannot rescue Aristotle from the charge of circularity here because, as I have shown with respect to his philosophy of science, the analogies and metaphors persist--albeit in carefully refined forms--in his definition of natural kinds. Though we might sometimes try to speak using as few analogies and metaphors as narrowly tailored as possible, we would still be using analogies and metaphors. Yet this last point applies both to those metaphors and analogies which constitute Aristotle's philosophy of science and to those metaphors and analogies which are theory-constitutive *within* a particular science. Philosophers of science would do better to remember not only that all experts begin as students, but also that many experts (both scientists and philosophers) are in the business of extending conventional scientific analogies and developing alternative theoretical metaphors in order to challenge whatever metaphors constitute the scientific and philosophic theories of their time.

Although I find Aristotle's argument against analogy proves ultimately vacuous, a final Aristotelian defense could be mounted along the following line: If the order of all being is in fact eternally true,[36] then we would not be equivocating once--at whatever point in time we happen to do it--we had ascertained what the true natural kinds actually were. However, in the post-Darwinian conception of biology where nature no longer

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[36] Aristotle *Posterior Analytics* 75b22.

consists of species defined according to their fixed universal essences, Aristotle's metaphysical argument for logical priority is patently impossible. There can be no ascertaining precisely what the natural kinds are if the natural kinds themselves are always in flux. In short, there is no antecedent order of being to which science can aspire to refer.

To give a straightforward example: an entomologist friend once delivered an address on the future of cotton beetle control to a Louisiana cotton-growers association which began: "I know that some of you who are of a certain religious persuasion aren't going to like the evolutionary explanation that I am about give you, but the best explanation of the matter is that the beetles have adapted to the pesticides." If the natural kinds do change, then our best methods of *techne* for dealing with the problems of life at a particular moment in time also deteriorate as time progresses. We cannot escape the regress problem of fighting the losing battle Aristotle foresaw, and the battle for us would be even worse. The lack of a final, fixed essential definition of a species means that we would have to continually fight it without end, continually creating new pesticides to destroy the essence of whatever new kind of insect crops up. For us things would be worse than Aristotle thought, for we could not ever escape this losing battle--not, of course, unless we were to jettison some of our heaviest Aristotelian baggage: the unwarranted separation of metaphor and analogy from science and philosophy. The change my entomologist friend advocated was a wholesale change in the way the cotton-growers approached pest management. This amounted to a change in metaphor from waging a war using pesticides as weapon to eradicate the beetles to one in which he argued that the cotton crops, like a car, would need more frequent maintenance to remove

the beetles from the cotton plant's crankcase.

It is also important to see that the attempt to eliminate metaphor and analogy from scientific theorizing does not depend on this particular (and problematic) definition of "natural kind" given by Aristotle. It is not the immutable and eternal character of the Aristotelian natural kinds that poses the problem, but the normative ideal that the proper standpoint of science is one from which it is possible to see all of nature laid out before it. Contemporary natural kind theorists often accept Darwin's critique of Aristotle's natural kinds, but they then argue that their sense of the term "natural kinds" is defined not by biology but by "the fact that its members have relevantly similar causal powers (or causal histories, etc.)."[37] But even when the use of the term natural kind is extended in this fashion, the normative ideal of finding scientific category terms which accurately match a presupposed theory-independent causal structure remains intact. Boyd's phrasing betrays this bias when he writes that "*we* accommodate *our* language to the structure of a theory independent world,"[38] and Plyshyn similarly explains that "the term eventually accommodates to the causal structure of the world."[39] This conception of theory-independent structure is the heart of what is wrong with the Aristotelian metaphysic.

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[37] Boyd, "Metaphor and Theory Change," p. 495. This point is also at the heart of Kripke's and Putnam's causal theory of reference.

[38] Boyd, "Metaphor and Theory Change," p. 490.

[39] Plyshyn, "Metaphorical Imprecision," p. 549.

Aristotle's Use of the Objectivity Cluster of Metaphors

One might initially think of Aristotle's rout metaphor as being both more embodied and more focused on the performative process of philosophical inquiry than the objectivity cluster of metaphors which I analyzed in the previous chapter. It is in fact both of these; but unfortunately his normative conception of knowledge is still governed by the objectivity cluster of metaphors. As I have just pointed out, Aristotle thinks there must be some theory-independent structure toward which the process of knowing must aim. Aristotle shows the extent to which he has inherited the Platonic/Socratic project of objective knowledge he sets out the distinction between temporal and logical priority (quoted here again for clarity). Notice particularly Aristotle's use of the mapping of ideas as objects:

> Now "prior" and "better known" are ambiguous terms, for there is a difference between what is prior and better known in the order of being and what is prior and better known to man. I mean that *objects nearer* to sense are prior and better known to man; *objects* without qualification prior and better known are those *further* from sense. Now the most universal causes are *furthest* from sense and particular causes are *nearest* to sense, and they are thus exactly opposed to one another.[40]

The similarity here to the Socratic and Platonic account of the objects of knowledge is striking. These idea-objects can be perceived as being more or less distant from the standpoint of the knower, and the most universal ideas are again those ones furthest from our ordinary embodied senses. I have argued in this chapter that Aristotle believes

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[40] Aristotle *Posterior Analytics* 71b-72a.

philosophical and scientific argument are supposed refer directly in a purely expository way; these objects of knowledge and the causal relations which hold between them are what it is supposed to refer to.

Remember that in recovering from the rout, the philosophers seek to recover the *original formation* of knowledge. That original formation of knowledge is (supposedly) the way things are causally organized as one would perceive them from an idealized philosophical perspective. As for Plato, knowledge is conceived as a complex web of objects organized by a organizational scheme internal to the objects themselves. As the organization and structure of the original formation of knowledge are supposed to precede any efforts to know it, these idea-objects (that is, the "objects without qualification" or the "true universals" or the "natural kinds") are *further* from our ordinary sensory experience while the ordinary objects are *nearer* to our ordinary sensory experiences. For Aristotle, the process of knowing as recovering from a rout merely zeroes in on the actual casual order of the objects of knowledge. As I pointed out, he also thinks this process must also have a final endpoint. Thus not only does he argue that there exists a causal order of such idea-objects, but he also argues that this order does not change as one's spatial or temporal location changes.[41] This timeless, spaceless, and permanent original formation of knowledge shows that Aristotle's more embodied metaphor of recovering from a rout in battle is governed by the same normative goal of the disembodied conception of objective knowledge that Plato and Socrates developed.

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[41] Aristotle *Posterior Analytics* 75b22.

For Aristotle therefore, the objective ideas in this "order of all being" are the theory independent structure to which all philosophical and scientific inquiry must refer. Given the underlying metaphysical picture of viewing objects from a great distance that is drawn by this cluster of objectivity metaphors, it is a perfectly reasonable consequence that the normative rhetorical form for philosophical and scientific argumentation should need to be pure exposition. Only pure exposition would be able to describe accurately the objects of knowledge and the links between them which comprise the world as seen from this idealized philosophical perspective. As metaphors indulge in drawing improper connections between the objects of knowledge, metaphors are to be impermissible in this purely expository form of philosophical and scientific inquiry. Metaphors and analogies would only obscure or occlude this pure philosophical vision; for Aristotle, even Socratic disanalogies are unwanted distractions.

Aristotle's injunction against metaphor and analogy is the climax of the process of turning metaphors first into analogies, then into disanalogies and finally into supposedly independent categories. To put this process explicitly into the terms of the KNOWING AS SEEING and the related metaphors of objectivity: It is as if with Aristotle as our guide we climb to the summit of the highest pinnacle, to the place from which we can see most clearly and whose height affords us a flattening perspective which makes everything plain. From that idealized perspective we are supposed to be able, as I argued Socrates suggested in Plato's *Protagoras*, to make all things commensurable. For Aristotle this perspective implies that we are able to see not only what the correct categories are (and what the causal connections are that define and make the categories independent of one

another), but also why the analogical relations across categories are improper from this perspective. Thus when we do science from the proper perspective, as we journey down the mountain, Aristotle enjoins us to refrain from doing science and philosophy using improper analogical connections instead of the properly causal connections.

Galileo's Salviati suggests that we should be our own guides wherever possible, just as Plato's Socrates sought to introduce to everyone a method for systematically assessing and measuring the quality of Athenian political rhetoric, a method designed to make the sophists unnecessary. Using the disanalogous inference drawn the appearance of near and far off objects and the knowledge of present and future pleasures, Socrates sought to undermine Protagoras' metaphor of Teaching Is Guiding and supplant it with one in which the students may see--and measure--for themselves objects of knowledge. Another strange implication of the objectivity cluster of metaphors generally and the Teaching Is Transmitting Objects metaphor in particular is that the metaphor is supposed to render the teacher unnecessary, for the students are to become capable of measuring the objects of knowledge themselves.

Supposedly, this paradoxical implication is quite natural and unproblematic given Aristotle's account shift to the philosophical perspective that one is supposed to make upon becoming an expert in a field. In contrast to the metaphysical picture Aristotle draws, I have argued that this paradox persists in scientific and philosophical practice. Yet even though I advocate rejecting Aristotle's metaphysical explanation of what happens in this shift, there remains the embodied phenomenological quality of the difference in our experience of ourselves before solving a paradox and after we had the insight which

dissolved a paradox. However in my reconstructed understanding of expertise, this shift in perspective is not a rising above metaphor (as Aristotle thought), but is instead the precise knowledge and skillful use of the metaphors appropriate to a given science.

In my view then, metaphors and analogies are crucial tools of the expert scientific and philosophical theorist. Rather than being mere matters of imprecise speech, metaphors, analogies and disanalogies are what constitute the scientific inquiry into causal relations. In a subsequent chapter I will discuss some of the historical and contemporary evidence that analogies and metaphors play crucial roles in setting out theoretical problems for scientific research and in the changing of the guard between successive scientific and philosophic theories. I will also discuss and expand upon the contemporary theory of metaphor as matter of conceptual thought. Before I embark on that project however, I will need to introduce a different metaphysical framework which can serve to replace the mistaken Aristotelian picture and its attendant exclusion of metaphor from knowledge.

If in fact we do abandon Aristotelian metaphysic together with its injunction against metaphor and analogy in science, we will still need criteria for explaining why some metaphors and analogies are more appropriate than others. In the next chapter I will be contrasting the Aristotlean metaphysical picture with Dewey's metaphysic of change and aesthetic reorganization, a metaphysic profoundly influenced by the account of a live creature seeking balance in a dynamic Darwinian environment. I will argue that Dewey's metaphysic provides a good framework for sorting out which metaphors and analogies we are to use. From the perspective of Dewey's embodied mind we have present problems,

and some metaphors are better than others in that they yield a more useful solution to those present problems. No one metaphor, no one metaphysical system, can constitute the basis for a fixed and final science. This does not leave us without metaphysics, but with a metaphysic of knowledge that consciously replaces the "is" copula with the "as if" copula, a metaphysic of knowledge that is deliberately tentative and revisable--in sum, a metaphysics not of natural kinds but of analogy and metaphor.

CHAPTER IV

THE EMBODIMENT HYPOTHESIS AND STANDPOINT THEORY: DEWEY'S *METAPHYSICS OF AS*

> To assume that, because from *the standpoint of the knowledge experience* things *are* what they are known to be, therefore ... everything in its reality (as distinct from its "appearance" or phenomenal occurrence) is what a knower would find it to be, is ... if not the root of all philosophic evil, at least one of its main roots. For this leaves out of account what the knowledge standpoint itself is *experienced as.*[1]

On the rare occasions that philosophers make it into the funny pages, they usually are drawn as a lonely figure perched atop a mountain. That this caricature is so instantly recognizable to us is testament to the success of Aristotle's conception of the philosopher as the all-seer. But in occupying the vantage point from which all things are seen, the philosopher is also supposed to be occupying the standpoint from which all things are known. The governing metaphor of this conception is one that identifies philosophic knowing with seeing. But this kind of sight is not simply our ordinary embodied sight, for this philosophic sight incorporates measurement. Measurement, as Socrates proposed it in Plato's *Protagoras*, is a method which corrects for appearances and discovers reality as it truly is. In this extraordinary philosophic sight, attaining the proper perspective means

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[1] John Dewey, *The Philosophy of John Dewey*, ed. by John J. McDermott (Chicago: University of Chicago Press, 1981), p. 243.

finding the standpoint from which things can be seen from the perspective of measurement. To know is to see, but it is to see as one would see from an extraordinary perspective that keeps as every object in the proper proportion to every other object. It is as if the measurements of each object were already built into the perspective, with the larger objects behind the smaller so that there are no discrepancies between relative sizes and measured sizes. Of course, there is no such *physical* standpoint which can be occupied by a fully embodied human being; this is why it is an *idealized* standpoint. While Aristotle's concern was not resolving the discrepancy between apparent and actual size but instead identifying the true (rather than the apparent) causes, his standpoint of all being was also just such an idealized perspective. When we philosophers "see" the "objects" of knowledge from this idealized philosophical standpoint, they are perceived as already being in their causal order. These classical Greek thinkers share the conviction that *things are as they are known to be* from this idealized standpoint, and as a result they conceive of the philosopher as the surveyor of all being.

Throughout the first half of the dissertation I have been tracing the origins of the conventional view that the use of metaphor, while perhaps permissible for philosophical beginners, is not admissible into mature philosophical expression. I have also been tracing an inextricably parallel story about changes in the rhetorical form of philosophy. When I first explored the use of metaphor by Presocratic thinkers, I argued that they chose to use the rhetorical form of paradox as a way to instigate philosophical reflection on the process of thinking through metaphors. For example Gorgias used paradoxes to call attention to the constitutive role of the metaphor of persuasive force in philosophical argumentation.

As I had also found with Heraclitus' paradoxes, I found Gorgias' paradoxes to be particularly philosophical because they provoked reflection on the nature of *logos* (philosophical reasoning) itself. I argued that these Presocratic self-reflexive paradoxes therefore had normative implications about what it is to engage philosophical inquiry. First, because specific acts of philosophical thinking require thinking metaphorically, philosophical inquiry in general is constituted by metaphoric reasoning. Second, because specific acts of philosophical thinking tend to lead to paradoxical conclusions, philosophical inquiry in general is best done in the rhetorical form of paradox.

When I turned to analyzing the metaphors of Plato's Socrates, I argued that Socrates' use of metaphor was no less provocative. Socrates introduced the rhetorical form of the *elenchus*, in which he specialized in challenging the metaphorical reasoning of the Presocratics by first cultivating their metaphors into extended analogies, and then pointing out a key disanalogy between the two domains of the metaphor. I argued that Socrates' attention to disanalogy reveals that he (like Gorgias) was concerned with how metaphoric reasoning could be too persuasive in argumentation, especially when those metaphors were turned to political ends. Thus I suggested that Socrates and Plato intended the *elenchus* to operate as a system of assessing the relative merits and demerits of rhetorical speeches, and to supplant paradox as the normative rhetorical form within which philosophical inquiry into those speeches ought to be done.

At the same time, however, I pointed out that the disanalogies intrinsic to Socrates' elenchic form suggest a certain metaphysical picture about the disembodied nature of ideas. This picture stems from disanalogical reasoning about the differences

between ordinary seeing and philosophical "seeing" that runs (roughly) as I have briefly recapitulated it in the first paragraph of this chapter. But a key insight in generating this metaphysics of the objectivity of knowledge stems from taking the elenchic form as revealing what it really is we are doing as we do philosophy. If metaphoric reasoning fails whenever Socrates manages to poke a disanalogical hole in it, then perhaps it would be better to study the nature of the domain in itself and apart from any distracting metaphors or analogies to other domains not under consideration. On this view, in philosophy we are supposed to study things as they really are in themselves.

However, this view of philosophy as essentially "ametaphoric" also implies that philosophy cannot have the elenchic form as its normative rhetorical form, as the elenchus requires cultivating metaphors into disanalogies. To really do philosophical inquiry in a manner which fully accords with this metaphysical picture of objectivity as studying knowledge in itself, further refinements to philosophy's rhetorical form are needed. This is why Aristotle proposes that philosophy must be done in the rhetorical form of pure exposition. Pure philosophical exposition must eschew the use of metaphors altogether, and simply describe the causal and logical natures of the domains in themselves.

Of course I have argued that both of these attempts to leave behind metaphor fail. This is why I have analyzed how the metaphoric reasoning plays a constitutive role in both Socrates' argument that philosophers must study virtue in itself and in Aristotle's conception of natural kinds. Now, in the second half of the dissertation, I want to explore the implications of the contrary view to the conventional one I have traced thus far in the dissertation. I begin by taking knowledge to be fundamentally embodied rather than

disembodied, and I develop a metaphysics of knowledge which can account for the constitutive nature of metaphoric reasoning in philosophical inquiry. After I establish an alternative metaphysical picture in this chapter, I will use it in a subsequent chapter as one of the bases for a framework that can sort out some thorny issues about the relationship between embodiment and metaphor in contemporary cognitive science. In my conclusion, I will then propose what I think are new possible rhetorical forms for philosophical inquiry that are better suited to this alternative metaphysical picture.

In this fourth chapter, then, I turn to a discussion of an alternative to the Aristotelian conception of what it is to know. This will require rethinking in a much fuller and more detailed way some the crucial points of the previous chapter. In particular, it will require developing a metaphysical picture that does not rely on the Aristotelian distinction between true knowledge as that seen from the standpoint of all being and the merely apparent knowledge which we can see from our ordinary embodied standpoint. This project will require reconceiving knowledge as a product of an embodied mind, instead of as something prior to minds. This kind of mind is not the Aristotelian *nous* which is a result of refinement through battle until it sees accurately the fixed and finished natural kinds of the pre-extant rational order of all being. Instead, it is an embodied mind, the result of an organism's struggle for continued existence in a changing and uncertain world. It has local purposes, local problems and local ends, all of which are situated in myriad brain-body-environment-culture interactions. The embodied mind implies that there are plural knowledges of varying degrees of lasting usefulness that emerge out of those interactions, rather than a single unified body of knowledge which is the correct

perception of an antecedent (and eternal) rational order.

To develop my alternative account, I will be using John Dewey's account of a naturalistic metaphysics. As it is situated in just such an account of the embodied mind, Dewey's account of a *metaphysics of as* rather than a *metaphysics of is* will prove to be instrumental in providing a metaphysical picture of knowledge which does not postulate an idealized rational order. I will begin by discussing the resonance of Dewey's theory of embodied mind with the theory of the embodied mind now being developed by the cognitive sciences. Though Dewey uses Descartes as his primary foil as he develops a theory of the embodied mind, it will be clear that Dewey also intends this theory to oppose other metaphysics (such as Aristotle's) which postulate an idealized rational order of knowledge and a disembodied philosophical standpoint. I will then turn to explicating how Dewey and contemporary cognitive science develop an explicitly non-Aristotelian and post-Darwinian metaphysic of knowledge and ideas. Here I explore how Dewey rethinks the Aristotelian metaphor of philosophy as biology, but with a revised and post-Darwinian conception of the "natural kinds." As the alternative metaphysical picture develops, I will begin to explore Dewey's other metaphors for knowledge. First, I will consider his conception of knowledge as an artistic process that exploits embodied esthetic tensions. Second, I will explore Dewey's rejection of the visual metaphors for knowledge in favor of a tactile metaphor for knowledge. Finally, I will conclude by showing how Dewey's conceptions of knowledge as art and knowing as touching cohere with Dewey's biological metaphor. I argue that the key point of coherence is Dewey's "live creature," the organism that falls out of balance with its environment and then regains equilibrium

with it.

I also should note that, as my purpose is to derive useful insights from Dewey which can be exploited to resolve controversies in the contemporary cognitive science of metaphor, I will draw primarily on Dewey's *Experience and Nature, Art as Experience,* and *The Quest for Certainty*.[2] Therefore I will not attempt the exegetical project of reconciling this account with other texts in the Deweyan corpus, but instead move to a discussion of how the Deweyan metaphysical picture of an embodied mind can help resolve some contemporary issues in cognitive science.

Dewey and the Embodied Mind

What does it mean to have a mind? John Dewey's answer to this question is simply put: a mind is a "response to the doubtful as such. No inanimate thing reacts to things *as* problematic."[3] Dewey's curious phrase "the doubtful as such" is an ironic reversal of the traditional metaphysical phrase "things as such." By it he means to point out that rather than being in the situation where an organism can even possibly know in advance what it is to do to solve the practical problems it faces, an organism is caught in a situation that produces doubt and uncertainty about what to do. Rather than being able to determine what to do by deducing how things are from the standpoint of an Aristotelian

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[2] John Dewey, *Experience and Nature* (Carbondale, IL: Southern Illinois Press, 1925), *Art as Experience* (Carbondale, IL: Southern Illinois Press, 1934), and *The Quest for Certainty* (Carbondale, IL: Southern Illinois Press, 1929).

[3] Dewey, *Quest for Certainty*, p. 179.

order of antecedent rational being (i.e., the tradition of knowing things *as such* or *in themselves*), Dewey ironically argues that beings like us--organisms, creatures capable of rational thought--experience *doubtfulness* as such, not the certainty implicit in the Aristotelian metaphysics. Thus of embodied live creatures (such as we humans) Dewey writes:

> the importance of a particular act in establishing conditions favorable to subsequent acts that sustain the continuity of the life process, becomes at once both more difficult and more imperative. Conditions of the environment become more ambivalent: it is more uncertain what sort of action they call for in the interests of living.[4]

Hence, what it means to have a mind (or to be a conscious being) is for Dewey intimately bound up with the existential question of what it means to be an organism in an environment.

For Dewey mind is an emergent capacity of complex life forms as they deal with an uncertain and doubt-producing existence. While organisms and environments interact and mutually change one another at all levels of complexity in life forms, the increasing awareness of the environment that is found in increasingly complex life forms produces conscious awareness of the uncertainty about what is to be done next. As organisms approach higher levels of complexity, they develop minds capable of suspending immediate judgments and thus capable of responding to uncertainty in increasingly sophisticated ways. Dewey observes that "behavior is thus compelled to become more hesitant and wary, more expectant and preparatory. In the degree that responses take

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[4] Dewey, *Quest for Certainty*, p. 179.

place to the doubtful *as* the doubtful, they acquire *mental* quality."[5] Uncertainty is the condition of existence for living beings; in increasingly sophisticated creatures the mind develops as awareness of that uncertainty and as the possible courses of action multiply.

As my primary purpose in this chapter is not to examine Dewey's theory of mind but the metaphysics which underlie it, I will only briefly explicate Dewey's theory of mind and its extraordinary parallels with contemporary theories of mind in cognitive science. The power of Dewey's theory of mind is perhaps best understood by means of a summary of how profoundly it challenges two metaphysical dualisms that continue to plague the philosophy of mind: the Cartesian dualism between mind and body and the dualism between the internal and external worlds. I will briefly outline these challenges in the next few paragraphs in order to set the stage for a more detailed analysis of their metaphyiscal underpinnings later in the chapter.

For Dewey mind and body are not separate things nor different substances: "There is no separate "mind" gifted in and of itself with a faculty of thought; such a thought ends in postulating the mystery of a power outside of nature and yet able to intervene within it."[6] Here Dewey is explicitly pitting his theory against the metaphysical project of Descartes' *Meditations*--the isolated conscious ego that attempts to find absolute foundations of knowledge by seeking knowledge beyond doubt. What Descartes famously found was that he could not doubt that he was a thinking thing--a "cogito." En route to

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[5] Dewey, *Quest for Certainty*, p. 179.

[6] Dewey, *Quest for Certainty*, p. 181.

this discovery, he considers forms of knowledge stemming from the body, but argues that the body is a source of uncertainty and error. As bodily sensations may come from dreaming as well as from actual experience, he argues that the senses are too uncertain to provide a firm foundation for knowledge. Descartes famously answers his dilemma about the uncertainty of bodily knowledge by founding knowledge on truths supposedly beyond doubt. In rapid succession he deduces from the cogito first the existence of God and then the mathematical and geometric truths, all of which are supposed to be absolutely certain and purely ideal. Absolute certainty is only available from a putatively pure mental realm, and it is only by locating knowledge in that realm that Descartes is able to escape from his skeptical project. This quasi-solution leaves both him and later philosophers with the notoriously intractable Cartesian problem of explaining how the body and mind interact. Even more importantly, however, Descartes has aligned the body-mind split with the contrast between uncertain situations and certain knowledge by arguing that bodily sensation is a source of uncertainty.

In contrast to Descartes, Dewey does not seek to escape from uncertainty by finding putatively indubitable truths. By taking doubtfulness as a real problem encountered by a living organism, he argues that we can address real human needs that a metaphysics of an idealized rational order simply sidesteps. He sees our (mistaken) desire to appeal to absolute certainty of an idealized rational order is natural enough, for we as human beings dislike uncertainty. Uncertainty signals an uncomfortable situation or a "dis-ease" which we would take almost any means to end. Dewey writes that we are

happy whenever "uncertainty is got rid of by any means fair or foul."[7] Hence he argues that the right way to overcome the Cartesian mind/body split is to address the underlying need--the desire to remove uncertainty from the human situation--by finding a means other than a traditional metaphysical picture of an idealized rational order which can assuage uncertainty. In the bulk of this chapter I will argue that this is precisely what Dewey's naturalized metaphysics accomplishes.

Dewey's conception of interaction between environment and organism also dissolves the split between the external world and the impressions or ideas of the internal mind with a flexible boundary between self and other. Simply put, Dewey argues that the world is not fundamentally other. Our mental selves extend at times far into the world, as when we are lost in artistic creation or physical play. When the situation is more problematic, more uncertain, our selves are smaller and more sharply defined. At times we might even enjoy a feeling of unity and peace with the environment. At other times we might feel utterly alienated from it. But even at such times the flexible self, the organism in a precarious and dynamic balance with the environment, has no fixed internal/external world metaphysical split. From the experience of the artist actively engaged in artistic creation, Dewey draws the model of esthetic play which he argues is our most effective response to uncertainty. I will discuss this model in detail later in this chapter, but first it is useful to consider how Dewey's theory of mind is consonant with the picture drawn by contemporary work in cognitive science.

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[7] Dewey, *Quest for Certainty*, p. 179.

Dewey's theory of the embodied mind is, I think, deeply insightful into the account of embodied mind that contemporary cognitive science is now giving us. Recent work in the cognitive sciences[8] extends and augments the Deweyan theory of mind by fleshing out the neurological and cognitive dimensions of the role of the body in our mental processes. To take only one example, consider how neurologist Antonio Damasio summarizes his theory of embodied mind in his book *Descartes' Error*:

> The idea that mind derives from the organism as an ensemble may sound counterintuitive at first. Of late the concept of mind has moved from the ethereal nowhere place it occupied in the seventeenth century to its current residence on or around the brain--a bit of a demotion, but still a dignified station. To suggest that the mind itself depends on body-brain interactions, in terms of evolutionary biology, ontogeny (individual development), and current operation may seem too much. But stay with me. What I am suggesting is that the mind arises from activity in the neural circuits, to be sure, but many of those circuits were shaped in evolution by functional requisites of the organism, and a normal mind will happen only if those circuits contain basic representation of the organism, and if they continue monitoring the states of the organism in action. In brief, neural circuits represent the organism continuously, as it is perhaps disturbed from the physical and sociocultural environments. If the basic topic of those representations were not an organism anchored in the body, we might have some form of mind, but I doubt that it would be the mind we do have.[9]

The parallels between Damasio and Dewey are striking. To list only a few of them: first, the mind depends on body-brain interactions; second, it has evolved to serve multiple

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[8] I have in mind works such as Antonio Damasio, *Descartes Error: Emotion, Reason and the Human Brain* (New York: Basic Books, 1995), Gerald Edelman, *Bright Air, Brilliant Fire: On the Matter of Mind* (New York: Basic Books, 1992), Mark Johnson, *Moral Imagination* (Chicago: University of Chicago Press, 1993), Mark Johnson, *The Body in the Mind: The Bodily Basis of Meaning, Imagination and Reason* (Chicago: University of Chicago Press, 1987), George Lakoff, *Women, Fire and Dangerous Things: What Categories Reveal About the Mind* (Chicago: University of Chicago Press, 1987), Michael Tomasello, *First Verbs: A Case Study of Early Grammatical Development* (New York: Cambridge University Press, 1992).

[9] Damasio, *Descartes' Error*, pp. 225-226.

functional purposes; and third, in practice it continuously monitors both the fluid boundaries between organism and the sociocultural world as well as the self's flexible personal boundaries from the physical world.

It takes no great philosophical acumen to notice that a theory of embodied mind is deeply incompatible with the conventional metaphysical picture, but the conventional picture of an internal mind and an external world is deeply entrenched in our language. Yet however strong the parallels between Damasio and Dewey, the traditional metaphysical picture of an internal mind which tries to represent correctly a real external world is insidious. Damasio writes:

> When I say that body and brain form an indissociable organism, I am not exaggerating. In fact, I am oversimplifying. Consider that the brain receives signals not only from the body but, in some of its sectors, from parts of itself that receive signals from the body! The organism constituted by the brain-body partnership interacts with the environment as an ensemble, the interaction being of neither the body nor the brain alone. But complex organisms such as ours do more than just interact, more than merely generate the spontaneous or reactive *external* responses known collectively as behavior. They also generate *internal* responses, some of which constitute images (visual, auditory, somatosensory, and so on), which I postulate as the basis for mind.[10]

Despite Damasio's desire to advocate a "brain-body partnership," the traditional picture is deeply embedded in the ordinary language he (and we) usually use to try to explain the embodied mind. Even as he writes about the flexible nature of the boundaries between mind, brain, body and world, notice that he refers to behaviors and environmental interactions as "external," while the collation of bodily sensory experience from the

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[10] Damasio, *Descartes' Error*, pp. 88-89, emphases added.

various sensory modalities into wholes which forms a basis for mind, is referred to as "internal."

There are two important issues I mean to raise by this quote. First, what both Dewey and a philosophy inspired by cognitive semantics require is not the sophomoric view that terms like "internal representations" and "external behaviors" should be avoided entirely in conversations in the philosophy of mind and in cognitive science.[11] While it is true that the particular language we choose to use is indicative of the metaphors which constitute our theoretical vision, we want to investigate what theoretical work is accomplished by those metaphors. Taking this argumentative line does not imply the view, which I have already argued against at length, that takes the particular language as merely incidental expression which conveys the "substance" of the arguments. Instead conceptual metaphor requires that we look further and try to determine what theoretical work, if any, such language is supposed to achieve. As I will explore in detail in the following chapter, conceptual metaphors build theories by *systematically* characterizing the object of study in ways that produce research hypotheses and problems.

The second issue I mean to raise is this very issue of whether or not Damasio's use of these terms systematically implies an internal mind/external reality split which will be

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[11] This procedure, while it has the advantage of continuing to use the customary language instead of inventing neologisms which often make for a nearly unintelligible theoretical framework, also has its drawbacks. Dewey's philosophical writings can be notoriously difficult to follow, as he often labors to overturn overextended philosophical terminology early in an essay, only to attempt to rejuvenate the same terms later in the same essay as he argues for his own view. For example, Dewey argues at length against the atomistic conception of 'experience' in British empiricism, but characterizes his own philosophy as a philosophy of experience.

counted on to do theoretical work. I think not. In addition to the fact that in the previous quote Damasio was stressing that the partnership of the mind and brain with the body, consider what Damasio writes about the conventional internal/external metaphysical split:

> While there is an external reality, what we know of it would come through the agency of the body proper in action, via representations of its perturbations. We would never know how faithful our knowledge is to "absolute" reality. What we need to have and I believe we do have, is a remarkable consistency in the constructions of reality that our brains make and share.[12]

Damasio is clearly committed to a theory of embodied mind and the metaphysical reconceptualization of reality that such a theory demands. The new metaphysical framework, while retaining the commitment to the existence of real phenomena external to human beings, has a metaphysics which is defined locally by specific human purposes at particular times and in particular places. Rather than taking its realist commitment as indicating that there exists a rational order in the universe to which our human systems must be faithful, the realist commitment here indicates merely that there exists the possibility of partially shared, partially different experiences across the multiple perspectives which result from human purposes at a number of specific times and places. A sound realist commitment in metaphysics on my view revolves around the more or less successful functioning of real organisms in their environments, not about representing correctly some external reality.[13]

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[12] Damasio, *Descartes' Error*, p. 235.

[13] Recently George Lakoff and Mark Johnson have offered some efforts at clarifying Dewey's metaphysics in a section of their forthcoming book *Philosophy in the Flesh* (New York: Basic Books, forthcoming 1998) entitled "Embodied Realism," and I will discuss their view in the following chapter of the dissertation. See also Lakoff, *Women Fire and Dangerous Things*, pp. 158-217 and pp. 260-8.

Dewey put forth a entire program of "naturalistic metaphysics"[14] as an alternative to the traditional metaphysical picture. The two major argumentative themes of this chapter are that Dewey's metaphysics replaces the "is" of conventional metaphysics with the term "as," and that Dewey's metaphysics provides much-needed theoretic ground for contemporary cognitive science. In an early statement of his metaphysics, Dewey's theory of "immediate empiricism" postulates that things "are what they are *experienced as*." If there are multiple accounts of how a thing is immediately experienced from a particular standpoint, then there are multiple "reals of experience" which differ in some specific real elements and agree in other specific real elements. In other words, what is "real" according to Dewey depends on how we experience and interact with our environment. It depends on how things are for creatures like us, with our specific bodies, perceptual structures, interests and values. Thus Dewey argues that in experimental science done well the statement of initial conditions (given a five-stage model of experimental science as containing a statement of initial conditions, a hypothesis, procedures, observations and conclusions)[15] includes an account of the standpoint of the scientist (i.e., the knower). This account of the initial standpoint of the knower is crucial in determining what "reals of experience" are experienced as comprising that thing.

Rather than assuming that the content of one account is to be designated as the exclusively "real" account and those of the others to be merely "phenomenal" accounts,

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[14] The phrase is Dewey's own. See *The Philosophy of John Dewey*, p. 282.

[15] Dewey, *The Philosophy of John Dewey*, p. 243.

Dewey argues that each account is real when the knowledge standpoint of each knower is included together with the account. By contrast, the standard philosophical project is to make precisely the erroneous assumption that the content of one account is real while the others are merely phenomenal; or at the minimum, to attempt to invent an all-knowing perspective which guarantees that all knowledge that proceeds from its vantage point is real and explains away the phenomenal appearances as mere byproducts of different, flawed perspectives. Thus the route traveled to this end requires that, in order to arrive at this all-knowing perspective, philosophers must treat knowledge as something which is the same for all knowers. Since they presume that it must be the same standpoint for all knowers, they can omit as inessential giving an account of what that particular knowledge standpoint itself is experienced as being. The recognition and critique of this error was the inspiration for Dewey's alternative account of metaphysics.

The omission of the knower's standpoint is precisely what Dewey identifies as "one of the main roots of all philosophic evil" in the quote with which I have begun this chapter:

> To assume that, because from *the standpoint of the knowledge experience* things *are* what they are known to be, therefore, metaphysically, absolutely, without qualification, everything in its reality (as distinct from its "appearance" or phenomenal occurrence) is what a knower would find it to be, is, from the immediatist's standpoint, if not the root of all philosophic evil, at least one of its main roots. For this leaves out of account what the knowledge standpoint itself is e*xperienced as.*[16]

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[16] Dewey, *The Philosophy of John Dewey*, pp. 242-44.

Dewey's immediate empiricism is an early formulation of his naturalistic metaphysics, and the first injunction in it is to include the standpoint of the knower with the account of knowledge. This injunction plays a dual role in the remaining sections of this chapter. First, this injunction requires me, as scholar, to identify my own standpoint as a knower. Second, the injunction has theoretical implications for the theory of mind as well: If minds are embodied, then a mind must be considered as including the embodied standpoint of the knower as well. That means that a theory of mind must not be merely a relocation of the mind from the non-physical into the body or brain, but must--as I have already suggested in quoting Damasio--include an account of the body's role in mental processes. Something very close to this latter version of the injunction is precisely the endpoint Damasio reaches in his conclusion:

> The comprehensive understanding of the human mind requires an organismic perspective; that not only must the mind move from a nonphysical cogito to the realm of biological tissue, but it must also be related to a whole organism possessed of integrated body proper and brain and fully interactive with a physical and social environment.[1]

However, this same realization is only the starting point for Dewey's naturalistic metaphysics.

Antecedent Being Versus Post-Darwinian Being: The Naturalism of Dewey's Metaphysics

I should like to begin my explication of the naturalism of Dewey's metaphysics by

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[1] Damasio, *Descartes' Error,* p. 252.

responding to Dewey's call to identify one's own standpoint as a knower. I consider myself someone who works both in cognitive science and in philosophy, who tries to describe mind in the languages of the many different sciences which study cognition and in philosophical terms as well. It might, I think, be easy to see the metaphysical reconceptualization which I am urging as solely driven by concerns stemming from one area of science and its intersection with philosophy. While this might be the case for me, it isn't quite for Dewey--I think Dewey's naturalistic metaphysics is motivated by a host of concerns in all of the fields of philosophy and by many different scientific matters.[18] Historically and chronologically Dewey's metaphysics was probably motivated most by Darwinian biology, and it is that theme of philosophy as biology I want to take up first as I begin to explicate his naturalistic metaphysics.

At the core of Darwinian biology is a cluster of concepts I call "population thinking," and at the heart of population thinking is the realization that chance variation is not error to be explained, but instead constitutive of what it means to be a species. The more varieties of adaptations in a population there are, the more trials there are, and therefore there are better odds of successful adaptation. As the cognitive neurobiologist Gerald Edelman points out, "population thinking considers variation not to be an error

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[18] Dewey himself mentions art, Darwinism, the Heisenberg uncertain principle, etc. In order to sharpen the contrast here between Dewey and myself, I have overemphasized the intellectual roots of Dewey's metaphysics; ultimately of course it is motivated by the practical problems of lived experience. However, as I will be elucidating some of the ways in which lived experience underlies art, Darwinism, etc., for Dewey, this selective emphasis will be amended by the end of this chapter. Both Dewey and I agree that metaphysics (and indeed all of our philosophical and scientific theorizing) is motivated by pragmatic problems which emerge from lived experience.

but, as the great evolutionist Ernst Mayr put it, to be real."[19] In other words, evolutionary processes incorporate chance and uncertainty within the system not as detrimental or erroneous (i.e., as mistakes), but as an asset.

Taking change as real influences how population thinking challenges both the traditional Aristotelian biology and the prevailing winds of metaphysics which accompanied it on four major tenets:

1. That species are fixed and immutable throughout all time;
2. That species are known by their exhibiting essential criteria which exist due to a logically antecedent rational order prior to the knower who "discovers" them;
3. That each member of the species has the essential criteria which define the species;
4. That species are final, whether finished by some teleological purpose given to them by nature or, as later Christian thinkers thought, by God's purposeful handiwork in creation.

In contrast, the parallel tenets of the conceptual cluster I call population thinking are:

1. That the species are not fixed but mutable;
2. That species are not known by discovering the essential criteria from a logically antecedent order in nature, but are instead known by the knower's designation of a temporally-bounded category (species) whose constitutive criteria are

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[19] Edelman, *Bright Air*, p. 73.

defined by the knower's purposes and methods (in Darwin's theory, the primary criterion is "interbreeding" or the theory of natural selection);

3. That each member of the species differs in their constitutive criteria not only from other species but from other members of the species in an irreducibly real fashion;
4. That species are always incomplete and in process, subject to change and emphatically do not develop in a pre-ordained fashion given by either an Aristotelian teleological nature or an omniscient God. Purposes exist, but they exist locally and in flux as brief biological responses to an environment: At least some organisms can undertake local actions to direct change purposively with respect to maintaining the equilibrium of the organism (and these are the organisms which we say have minds).

Dewey recognized that taking variation as a constitutively real fact undermined not only the traditional picture of biology, but the prevailing classical metaphysics of categorization as well:

> The Darwinian principle of natural selection cut straight under this philosophy. If all organic adaptations are due simply to constant variation and the elimination of those variations which are harmful in the struggle for existence that is brought about by excessive reproduction, there is no call for a prior intelligent causal force to plan and preordain them.[20]

Population thinking, in arguing that the metaphysical picture required by the classical notion of a species is simply an inaccurate conceptualization, offers us an alternative

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[20] Dewey, *The Philosophy of John Dewey*, p. 37.

conception that takes temporal change as real, rather than limiting the "real" to a realm of antecedent being.

However, Dewey recognizes that the naturalism of Darwinian thought shares two important tenets with the naturalism in Aristotelian thought, though they are tenets which he argues Aristotle quickly stifles. The first shared tenet is that for both Aristotle and Dewey there is a continuity between biology and cognition. Cognition emerges as a natural biological process (which I outlined in the previous chapter). However Dewey is justifiably troubled by Aristotle's further step of identifying the categories of thought with the natural kinds of biology.[21] The second shared tenet is that Dewey finds the metaphysical pluralism of Aristotle preferable to monism and dualism. In *Experience and Nature* Dewey writes that:

> Aristotle perhaps came nearest to a start in that direction [toward a "naturalistic metaphysics"]. But his thought did not go far on the road, though it may be used to suggest the road he failed to take. Aristotle acknowledges contingency, but he never surrenders his bias in favor of the fixed, uncertain and finished.... His physics is a fixation of ranks or grades of necessity and contingency so sorted that necessity equals dignity and degree of reality, while contingency and change measure degrees of deficiency of Being. The empirical impact and sting of the mixture of universality and contingency and chance is evaded by parceling out the regions of space so that they have their abode in different portions of nature.[22]

Dewey's cautionary remarks are motivated by the observation that Aristotle's pluralism is

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[21] See Dewey's discussion of natural kinds in Aristotlean logic in *Logic: The theory of inquiry*, pp. 252–254. Dewey argues that Aristotle's ontological conception of logical kinds as species (natural kinds, i.e. biologically based) is fundamentally flawed. Thus Dewey would be ambivalent to Aristotle's naturalistic account of the emergence of mind from biology in PA 2:19, though he would be opposed to the identification of the universals with the kinds of animals.

[22] *The Philosophy of John Dewey*, p. 282-3.

a value-laden gradation of things according to their degree of reality. According to Aristotle's value system the more real something is, the less it changes. Things in the heavens change little, so they partake of the highest degree of reality, while things on the earth change very much and so are much less real. The degree of reality of something is correlated with the amount it stays the same--and conversely, its unreality with how much it changes. Following out this logic, objects in Aristotle's physics seek their natural place--their natural region in space--in accordance with their degree of reality.

Despite not going far enough down the road of a genuine naturalistic pluralism, Dewey writes that Aristotle's philosophy

> was closer to empirical facts than most modern philosophies, in that it was neither monistic nor dualistic but openly pluralistic. His plurals however fall within a grammatical system, to each portion of which a corresponding cosmic status is allotted. Thus his pluralism solved the problem of how to have your cake and eat it too, for a classified and hierarchically ordered set of pluralities, of variants, has none of the sting of the miscellaneous and uncoordinated plurals of our actual world.[23]

Though Dewey recognizes that Aristotelianism exhibits a kind of metaphysical pluralism, he believes the relegation of the status of change and variation to the "unreal" ultimately undermines the pluralism of the Aristotelian metaphysics. Dewey is perfectly willing to admit that there is a "real," brute facticity exhibited in kinds of being which are long lasting and demonstrate real skill and control over contingency, but Dewey argues that as change and contingency have the same kind of "real," brute facticity that permanence has, ranking one kind of being over another on this basis is an untenable perversion of

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[23] *The Philosophy of John Dewey*, p. 283.

pluralism. Change is not unreal; it is just as real as persistence. This difference in their willingness to consider change as real is one of the crucial criteria which differentiate the essentialism of Aristotle's biology from the mutability of the Darwinian evolutionary biology that Dewey embraces.

There is, I think, no good reason not to attempt to extend the logic of population thinking and variation into other bodily systems, as they are also biological systems. In many cases this extension has proved crucial to the development of science. Consider how human immune systems resist invasion by antigens:[24] How do bodies distinguish between novel proteins and the body's own? Does the body use some means to obtain information about whether the antigen belongs to a species other than that to which the body belongs and then instruct the body to make lymphocytes (immune system cells) with antibodies which bind to that specific antigen?

Our best contemporary explanation of the actual process is not dependent on the hypothesis that the world is intelligible--i.e., the world provides specific differentiating information to the body's immune system. Instead, the explanation entails that immune systems tolerate indeterminate information extremely well. The antigen encounters not a cell but a *population* of cells, each with a *different* antibody on its surface. Whenever the antigen encounters cells with an antibody somewhat complementary to it, it binds to the antibody. If the fit is adequately close, the cell is stimulated to clone itself repeatedly--producing an increase in the population of many different cells ready to interact with that

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[24] I owe my account to Edelman's in *Bright Air*, pp. 73-80.

antigen should it be presented again.

A brief step-by-step summary of the important points in this Darwinian account of how the human immune system resists antigens might prove useful to keep in mind.

1. The antigen binds to multiple lymphocytes, each with a different antibody.
2. Though an antigen binds to an antibody, the fit of this binding is of variable quality.
3. Only if the fit is sufficiently tight will a particular range of lymphocytes be stimulated to clone themselves.
4. As the process works in an analog manner over a range, a range of multiple lymphocytes with antibodies with differing degrees of fit will be stimulated to clone themselves.
5. This process continues whenever any antigens are encountered in the body.
6. The net result is an ongoing differential amplification of a variety of lymphocyte cells.
7. This differential amplification produces a immune system which can "remember" a particular kind of antigen, in which the system and not the individuals cells do the "remembering."

The immune system is dynamic because the population of cells within the immune system is constantly in state of flux, though the population tends to settle down around an optimal state in which there are very few antigens in the body at any one time. Rather than executing a procedure which requires accurately ascertaining information (i.e. not making errors) about to which natural kind the antigen belongs, the lymphocytes co-

operate as a system of the body--as an organ--and respond successfully to indeterminate variable information. The immune system accommodates error by embodying an analog system of continuously varying populations of cells. These cells differ from one another in ways that are crucial to the effective functioning of the immune system. In other words the effective functioning of the immune system depends on an irreducible pluralism of the lymphocytes. The threats posed by the antigens of the different kinds of not-self is met by the openly pluralistic response of variation within populations of lymphocytes, together with a process of differential amplification analogous to natural selection.

Just as embodied immune systems work by taking population thinking and change as fundamentally real, so does the embodied mind. In the broadest possible terms, part of what it means to think through the standpoint of the knower to the account of knowledge is then to ask what relationship our bodies and brains, as organisms which utilize the Darwinian logic of variation within populations, have to our minds as we produce knowledge. Dewey argues that not only has Darwin shifted our conception of how natural kinds are constituted, but that shift requires rethinking our philosophical traditions about how human categorization and human knowledge-building work.

The impact of the metaphysical shift from an Aristotelian antecedently extant Being to a post-Darwinian conception of being as variant should not be underestimated. In making a distinction between temporal and logical priority, between what is better known to us and from the vantage point of the being of things, Aristotelian metaphysics conceives the proper standpoint of knowledge as a standpoint beyond the change and contingency of the mundane world. Dewey summarizes the traditional knowledge

standpoint in a 1917 essay:

> The essential thing is that the bearer was conceived as outside the world; so that the experience consisted in the bearer's being affected through a type of operations not existing anywhere in the world, while knowledge consists in surveying the world, looking at it, getting the view of a spectator.[25]

The metaphysics which proceeds from the Aristotelian knowledge standpoint is a *metaphysics of is,* a metaphysics of *"natural kinds,"* in which claims about knowing are understood to be ontological claims about what a species *is* to be for all time, and with absolute certainty.

By contrast, Deweyan metaphysics is a *metaphysics of as*, a metaphysics of uncertain but persistent ad-hoc categories, in which claims about knowledge are understood as claims about what species *are experienced as* by specific human beings with specific human purposes. Thus Dewey writes:

> There are two little words through explication of which the [immediate] empiricist's position may be brought out--"*as*" and "*that.*" We may express the presupposition by saying that things are what they are experienced *as* being; or that to give a just account of anything is to tell what *that* thing is experienced to be.[26]

In taking experience as the local and situated response of embodied mind to the uncertain and precarious elements of life, the logic of variation and change in our categorization is built into the *metaphysics of as*. The irreducible metaphysical pluralism between the different knowledge standpoints entails an irreducible difference between the experiences

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[25] Dewey, *The Philosophy of John Dewey*, p. 75.

[26] Dewey, *The Philosophy of John Dewey*, p. 245.

of different individuals. The logic of population thinking applied to our experiences as embodied creatures entails that an ontogenetic development of successful responses to both the similar and the different in the environment, to both the precarious and the stable in our human experience, is then passed on phylogenetically--a process resulting in the evolution of an embodied, variant mind. The impact of Dewey's reconceptualization of metaphysics is that our knowledge claims are always tentative and hypothetical, and knowledge must vary by individuals.

However, that is not to suggest that the phylogenetic fact that the human species has mind suggests that mind is developed exclusively out of physically embodied ontogenetic responses to existential crises. The cultural and social embodiment of the mind further deepens and extends the knowledge produced by the physical embodiment of the mind; differences as well as similarities in experience are reinforced by culture and language. The conception of nature here is both physical and cultural, and sometimes the evolved sociocultural responses are what provide the necessary stability. "Nature," Dewey writes, "is characterized by a constant mixture of the precarious and the stable. This mixture lends poignancy to existence."[27] From the multiple vantages of the *metaphysics of as*, to be human is to be an embodied mind caught in both biological and socio-cultural environments which are sometimes generous and providing but at others tractable and inhospitable. Humans are caught in the mixture of the contingent and the necessary, and the mind is the evolving response to these conditions of life.

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[27] Dewey, *Quest for Certainty*, p. 194.

The mind or self, flexibly constituted in this way, thus extends far into the world rather than existing only internal to the body and therefore dichotomously apart from the world:

> But if it be true that the self or subject of experience is part and parcel of the course of events, it follows that the self becomes a knower. It becomes a mind in virtue of a distinctive way of partaking in the course of events. The significant distinction is no longer between the knower *and* the world; it is between different ways of being in and of the movement of things; between a brute physical way and a purposive, intelligent way..... the self becomes a knower or mind when anticipation of future consequences operates as its stimulus.[28]

Knowing, as a mode of intelligent operation of organisms with minds, brings about purposive changes in its future interactions with the world. In doing so, it contributes part of the stability of the world by establishing patterns of successful interaction within the brain, and these patterns then guide the organism to deal successfully in future encounters with the world. Profoundly successful patterns may then be passed on via both phylogenetic and sociocultural methods, but Dewey correctly argues that these patterns of knowledge are never really independent of their basis in the knower-known relationship. Instead, they are the products of an embodied mind.

Dewey argues that, by abandoning the spectator theory of knowledge together with its attendant objectivist metaphysics in favor a theory of embodied mind together with a metaphysics of as, we are provided a better opportunity to develop methods for dealing effectively with problematic situations:[29]

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[28] Dewey, *The Philosophy of John Dewey*, p. 91.

[29] Dewey (*Quest for Certainty*, p. 191) says this is the essential response of mind.

> The spectator theory of knowing may, humanly speaking, have been inevitable when thought was viewed as an exercise of a "reason" independent of the body, which by means of purely logical operations attained truth. It is an anachronism now that we have the model of experimental procedure before us and are aware of organic acts in all mental processes.[1]

The rejection of an antecedent rational order in metaphysics, a reason independent of the body reacquaints us with what it means to be human as humans--we are beings which set local ends and carry out local purposes. We have, I think, now come to the centerpiece of Dewey's naturalistic metaphysics: The practical difference that methods of embodied reasoning can make to human lives.

Does the *Metaphysics of As* Make a Difference? Dewey and the Art of Experimentation

A common, and I think legitimate, response to Dewey's critique of the spectator theory of knowledge is to ask what we might put in its place. What practical difference does a theory of embodied mind or a *metaphysics of as* make for how we live our lives? Often the Deweyan response is to fall back onto arguments reconceiving the experimental method in science--an important but rather restricted domain of application--but I want to suggest in this section that the experimental method which Dewey valorizes is felt in more modes of human activity than science alone. In particular, I argue that Dewey's conception of philosophy as biology leads to a conception of scientific philosophy as an artistic product.

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[1] Dewey, *Quest for Certainty,* p. 195.

Dewey conceives of science as fundamentally tentative, as attending to consequences, and as the art of developing operations which produce reliable results. The art of purposefully applying these operations to problematic situations brings about a transformation of the world which is peculiarly human:

> The history of human progress is the story of the transformation of acts which, like the interactions of inanimate things, take place unknowingly to actions qualified by understanding of what they are about; from actions controlled by external conditions to actions having guidance through their intent:--their insight into consequences. Instruction, information, knowledge, is the only way in which this property of intelligence comes to qualify acts originally blind.[31]

In Dewey's understanding of history, the intentional activity of the mind in collating, collecting and submitting information for and to experimentation, is a natural purpose of human beings as human beings. This activity is performed with the intent of gradually transforming the instability and uncertainty of life to a more stable and guided life.

Therefore, like uncertainty, human purposes exist as objectively as anything does in his reconceptualized metaphysics. The redemption of a notion of natural purpose, as opposed to the pre-ordained final purposes of the tradition, allows Dewey to argue that

> ... intelligent action is purposive action; if it is a natural occurrence, coming into being under complex but specifiable conditions of organic and social interaction, then purpose is an intelligence within nature; it is a "category" having objective standing and validity. It has this status in a direct way through the place and operation of human art within the natural science: for distinctively human conduct can be interpreted and understood only in terms of purpose.[32]

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[31] Dewey, *Quest for Certainty,* p. 196.

[32] Dewey, *Quest for Certainty,* p. 196.

Dewey's experimental method of science is not, therefore, discontinuous with his theory of the embodied organism, but instead an outgrowth of it. However, I think we are still missing a middle stage here, one which will illuminate the alternative theory Dewey proposes to replace the spectator theory of knowledge.

For Dewey knowledge, sciences, and ideas "evolve," in a limited sense of that word, purposefully. Put more directly, the mind, as an evolutionary adaptation, brings into being sciences which are differentiated from other forms of artistic production and develop and survive insofar as they are more or less successful. Dewey writes:

> In short the history of human experience is a history of the development of the arts. The history of science in its distinct emergence from religious, ceremonial and poetic arts is the record of a *differentiation* of arts, not a record of separation from art.[33]

The differentiation of which Dewey speaks is a version of natural selection applied to ideas, or sciences, as they vary from other modes of knowing. Like the explanation of the immune system's differential response to antigens, there is a differential selection of the human ideas on how to cope with the practical problems of living, and scientific knowledge is one set of ideas about how to best respond to such practical problems.

Thus the missing middle stage is that sciences are variant individuals within the realm of the human arts. All human activities of inquiry, art and science alike, are responses to the uncertain environment and seek to project into the future by linking means with consequences and enabling the organism to better survive:

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[33] Dewey, *The Philosophy of John Dewey*, p. 322.

> Science is an instrumentality of and for art because it is the intelligent factor *in* art.... The connection of means-consequence is never one of bare succession in time, such that the element that is means is never one of bare succession in time. An active process is strung out temporarily, but there is a deposit at each stage and point entering cumulatively and constitutively, into the outcome. A genuine instrumentality *for* is always an organ *of* an end. It confers continued efficacy upon the object in which it is embodied.[34]

Science, like other forms of inquiry, is a process of building up and returning to a set of tentative hypotheses and methods which are instrumental in maintaining the integrity of the organism's self. Thus Dewey can argue that "the idea is, in short, art and a work of art."[35]

At the heart of Dewey's metaphysics we find the esthetic as the quality which runs through all experience, though all modes of knowing. The esthetic is understood by Dewey not to be the disembodied esthetic of fine art, but instead that fine art is but a refined version of the species of useful art. Dewey finds the instrumentality of a finely made tool to be just as esthetic as the development of a realistic perspective in the fine art of the Italian Renaissance--and in fact he would not have been surprised by more recent scholarship which argues that the artistic revolution in perspective proceeded hand-in-glove with better mathematical techniques for representations in architectural blueprints. The drafting techniques were not a mere means to an end and the artworks not merely ends sought for their own sakes. Means and ends are not intrinsically separate for Dewey but are united by esthetic tendency, a felt sense of the possible union of means and ends

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[34] Dewey, *The Philosophy of John Dewey*, p. 310.

[35] Dewey, *The Philosophy of John Dewey*, p. 312.

which Dewey calls an end-in-view.

For Dewey a tendency involves a predisposition to move in a certain direction, but without complete foreknowledge of what the end product will be. In artistic creation, Dewey argues that while there might be some ongoing perception of meaningful patterns which directs the artwork forward in a particular direction, at best the artist has only an "end-in-view" during the process of creation. He writes:

> The idea of tendency unites in itself exclusion of prior design and inclusion of movement in a particular direction, a direction that may be either furthered or counteracted and frustrated, but which is intrinsic.... it [the idea of tendency] may also contain a perception of meanings such as flexibly directs a forward movement. The end is then an *end-in-view* and is in constant and cumulative re-enactment at each stage of forward movement. It is no longer a terminal point, external to the conditions that have led up to it; it is the continually developing meaning of present tendencies--the very things which as directed we call "means." *The process is art* and its product, no matter at which stage it be taken, it is a work of art.[36]

Ends-in-view are not fixed finishing points from which we survey all being, but are goals that are set, realized and then further extended. They constitute a means-end complex that unites the possibilities of a particular situation with fruitful resolutions of it, and in turn shape the next set of desired ends.

The mind comes to set our particular ends-in-view because a particular problematic situation is pregnant with possibilities which intrinsically tend in one or more directions. These possibilities are "intrinsic" only in a limited, non-Aristotelian sense as they do not already contain a fixed and final form to which they inevitably lead. Instead tendencies are the felt sense of the possibilities of an esthetic resolution of a problematic

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[36] Dewey, *The Philosophy of John Dewey*, p. 313.

situation. The esthetic tendencies in a situation, just as with the felt sense of an organism as it falls in and out of balance with its environment, provide a continually emergent sense of the means available which might lead to the development of a meaningful end. Further, this process is "richly-textured," which is to say that it occurs both simultaneously and successively on multiple and overlapping levels. Dewey writes that the artistic sense…

> grasps tendencies as possibilities; the invitation of these possibilities is more urgent and compelling than that of the given [end] already achieved. … [This] means-consequence relationship is directly sensed, felt, in both appreciation and artistic production.[37]

The pervasive esthetic quality of experience is what Dewey offers as a replacement for the disembodied experience of knower in the spectator theory of knowledge. Dewey argues that scientific prowess is a type of art, and art emerges from our felt sense of the directions intrinsic to situations as we experience them. Scientists have hunches, a sense of the tendencies which guide them to generate hypotheses. Dewey writes:

> Scientific method or the art of constructing true perceptions is ascertained in the course of experience to occupy a privileged position in undertaking other arts. But this unique position only places it more securely as an art; it does not set its product, knowledge, apart from other works of art.[38]

Knowledge, insofar as it is the artistic product of science, is also shot through with the esthetics of experience. The experimental method of Deweyan science is always tentative, always in process even as it produces its products. Knowledge, as a form of art, is forever undergoing the continual development and refinement of means. Thus Dewey places his

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[37] Dewey, *The Philosophy of John Dewey*, p. 314.

[38] Dewey, *The Philosophy of John Dewey*, p. 317.

emphasis equally on method and product in science, united by an esthetic sense derived from the embodied mind's experience of maintaining a flexible equilibrium of self.

Conclusion: The Practical Upshot

The practical difference all this makes is that Dewey's metaphysics provides a way to bring together our ordinary and theoretical senses of what it is to know. In this concluding section I will argue that in replacing the spectator theory, a theory of embodied mind conceives a bodily perspective on knowledge rather than conceiving a universal knower. More specifically, the spectator theory of knowledge gives way to a multimodal theory of knowledge, one in which metaphors of taste, touch and hearing play an equal role to those of sight.

Sight was the perceptual mode most phenomenologically suited to the objectivity of traditional metaphysics, and was therefore privileged by it, as sight normally works well at a greater distance than touch or taste. Observation is easily detached from the operation of the embodied mind and left to the mind. Taste, by contrast, is an intensely bodily phenomenon, involving not merely its own peculiar mode but the tactile modality as well. Is it any surprise that taste thus served as the metaphoric model for subjectivity? Dewey's metaphysics restores all the various sensory modalities together with their embodiment to the activity of knowing. Even sight, on Dewey's terms, becomes perspectival: our limited, local purposive activities are ends-in-*view*. Each modality is privileged and appreciated in turn, but in the end they all work together.

Though Dewey does not wish to hang his theory of the scientific method too closely on any one scientific experiment, buried in his discussion of the Heisenberg uncertainty principle is a germ of rhetoric that embodies the shift in theory of knowledge Dewey is trying to effect. No one disagrees that the Heisenberg uncertainty principle illustrates that when measuring either the velocity or the position of an electron it is impossible to ascertain both values precisely at once. The reason is simple; observation presupposes a kind of interaction which will change the measured values. The observational result is necessarily indeterminate. Dewey likens this indeterminancy to a theory of knowledge which stems from touch: "We should all, I suppose, recognize that when we perceive an object by means of touch, the contact introduces a slight modification in the thing touched."[39]

We might for a moment think carefully on how different a "touchy-feely" theory of science is from a "spectator" theory. First, the knower-known relationship is now one in which it is fundamental to accept that observation effects changes in the objects of knowledge. Second, this relationship also effects changes in the observer; these changes are the result of a simultaneous interaction. The experimental method is one which involves human agency, one which reaches out and touches the environment, manipulating and changing it as it comes to know it. This entails that the philosophy of knowledge and the philosophy of art, ethics and politics (i.e. value theory) are not of radically different kinds. Thus, not only value theory but also the philosophy of knowledge must give an

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[39] Dewey, *Quest for Certainty,* p. 162.

account of human agency.

Dewey turns to analyzing metaphors of yet another perceptual modality--taste--when he wants to explain how an embodied theory of knowledge can reshape value theory. For Dewey the primary problem in understanding traditional value theory is understanding why philosophers are motivated to either nihilism or prescriptivism, and the primary problem for doing value theory is to breathe new life into the dead metaphors which embody the debate. He sets out precisely this problem by inverting the traditional rhetoric of taste:

> The word "taste" has perhaps got too completely associated with arbitrary liking to express the nature of judgments of value.... Instead of there being no disputing about tastes, they are the one thing worth disputing about, if by "dispute" is signified discussion involving reflective inquiry.[40]

Dewey is here referring to the traditional metaphoric association of taste with philosophical subjectivity, and he means to breathe new life into the debate by arguing that tastes are worth disputing. What is traditionally derided as the Humean[41] (or subjective) theory of tastes as arbitrary likings must be rethought, but Dewey sees much in the bodily sense of taste that should be redeemed for philosophical inquiry:

> Expertness in taste is at once the result and the reward of constant thinking.... Taste, if we use the word in its best sense, is the outcome of experience brought cumulatively to bear on the intelligent apparatus of the real worth of likings and enjoyments.... The formation of a cultivated and effectively operative good judgment or taste with respect to what is esthetically admirable, intellectually acceptable and morally approvable is the supreme task set to human beings by the

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[40] Dewey, *Quest for Certainty,* p. 209.

[41] A substantial misreading of Hume, but one which nonetheless has currency.

incidents of experience.[42]

Why choose taste from all the different senses as the sense to redeem as the "supreme task" of value theory? I believe the question demonstrates how thoroughly Dewey believed that humans were organisms embodied in an environment. Of all our philosophical endeavors, value theory is perhaps that which is closest to our everyday lived experience; the formation of our ethical selves is inextricably bound up with the values used as we make our choices and set our goals. Dewey puts this point as follows:

> If the word ["taste"] be used in the sense of an appreciation at once both cultivated and active, one may say that the formation of taste is the chief matter wherever values enter in, whether intellectual, esthetic or moral.[43]

I think that the reason Dewey claims that taste metaphors are a better able to guide ethics than sight metaphors is because, of all our senses, taste is the one most inextricably bound up with the everyday choices we make and the foods we find satisfactory. As such, it makes a natural basis for something as everyday and as controversial as ethical decisions. Hence, ethical decisions are best understood as the debate over what tastes are to be cultivated through intelligent means. That is the practical upshot of the Deweyan metaphysics in terms of how we are to live our everyday lives. The goods we choose, the solutions to problems we encounter, and the tastes which we share are determined through our interactions with the environment we both find ourselves in and modify for the future.

It might be argued that the upshot of this metaphysical reconceptualization is

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[42] Dewey, *Quest for Certainty,* p. 209.

[43] Dewey, *Quest for Certainty,* p. 209.

merely that we should change our rhetoric about--that is, our metaphors for--knowledge in the course of continuing to do science and philosophy as we have always done them. Usually an objection such as Dewey's is deemed to be "mere rhetoric" from the standpoint of those who would maintain a traditional metaphysics, and with consistent reasoning: From the standpoint of a *metaphysics of is,* rhetoric is necessarily nonessential. The fact that sight serves as a metaphor for objective knowledge and that taste serves as a metaphor for subjective knowledge is irrelevant if the distinction between objective and subjective has ontological status as real; in principle, any theory supposedly can be redescribed independently of any metaphors and according only to the logic of things. Analogies and metaphors have no status as metaphysically real; they are either trangressors, outlaws which break the boundaries of the categories, or they are purely figurative adornments.

But in the *metaphysics of as* metaphors and analogies are constitutive of our categories; and while some categories are fleeting and ad-hoc, others (and more useful ones) are more persistent. They are metaphysically real because they denote similarities and differences as experienced. There is no *mere* rhetoric in a *metaphysics of as,* for understanding human beings as incomplete and purposeful beings is to suggest that *how* science proceeds as important as the *that* which science seeks to understand. Changing the rhetoric of science, then, changes how the problems of knowing are set up for us; we come to ask different questions. Old questions in the philosophies of mind and language dissolve and fade away; we no longer ask questions about the correspondence between the objects of the mind or language and states-of-affairs in the world, but instead we ask

physiological questions about human ontogenetic and phylogenetic mental development.

Moreover, this investigation into the importance of how we know and how we theorize about knowing yields insights and hypotheses for contemporary cognitive science. Like Dewey, many contemporary cognitive scientists argue that not just vision, but all the modalities are important to how we develop our ideas. For example, Daniel Stern describes experiments in which an upset baby is calmed by either action in the auditory or tactile sensory modality. The caregiver can calm a baby by saying the words "there, there, there" using a pattern of initial stress and subsequent lessening of stress or the caregiver may give the same pattern as a firm stroke followed by two lighter strokes on the infant's forehead. From this and a number of related experiments, researchers propose that human cognition may employ a number of low-level "affect" (felt) patterns which are multimodal. Like the esthetic in Dewey's metaphysics, they further argue that language and conceptual thought depend on a pre-conceptual level of felt cognition in which experiences cross between multiple modalities.

In short, the naturalism and the esthetics of the Deweyan metaphysics provide the background for contemporary accounts of an embodied mind that can think in ways which are both partially different and partially the same across individuals. A *metaphysics of as* is a metaphysics which allows for the free play of the same and the different; it allows the creation of a plurality of mental spaces, a plurality of categories which can cross, overlap, be combined or blended as serves the existential and biological purposes of the mind.

In a long but poetic passage, Dewey explains how existential problems emerge, via their roots in the esthetic sense, out of the embodiment of the live creature and into the

cognitive domain:

> At every moment, the living creature is exposed to dangers from its surroundings, and at every moment, it must draw upon something in its surroundings to satisfy its needs. *The career and destiny of a living thing are bound up with its interchanges with environment,* not externally but in the most intimate needs.
>
> The growl of a dog crouching over his food, his howl in time of loss and loneliness, the wagging of his tail at the return of his human friend are expressions of the implication of a living in a natural medium which includes man along with the animal he has domesticated. Every need, say for hunger for fresh air or food, is a lack that denoted at least a temporary absence of adequate adjustment with surroundings. But it is also a demand, a reaching out into the environment by building at least a temporary equilibrium. Life itself consists of phases in which the organism falls out of step with the march of surrounding things and then recovers unison with it--either through effort or some happy chance....
>
> These biological commonplaces are something more than that [mere biological consequences]; they reach to the roots of the esthetic in experience.[44]

This felt sense of the esthetic is the right basis for an embodied theory of mind. As it is central to a *metaphysics of as* in which everything we know is not only tentative but constructed from and constituted by our embodied experience, it is integral to the emerging picture of human cognition in the new cognitive science.

I now turn to a discussion of the details of the embodiment hypothesis with respect to the new cognitive science of metaphor. In the next chapter of the dissertation I will use this Deweyan metaphysical picture of the embodiment of knowledge as a part of my framework to organize the recent work within cognitive science. I will show how the Deweyan framework helps resolve some of the contemporary debate over recent formulations of the embodiment hypothesis.

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[44] Dewey, *The Philosophy of John Dewey,* p. 535.

CHAPTER V

THE EMBODIMENT HYPOTHESIS IN THE COGNITIVE SCIENCES

> My art of midwifery is in general like theirs; the difference is that my patients are men, not women, and *my concern is not with the body* but with the soul that is in travail of birth.[1]
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> I wonder if we can make it clear to ourselves like this: If a man were trying to judge, by external appearance, of another's health or some particular physical function, he might look at his face and hands and then say: "Let me see your chest and back too, so that I may make a more satisfactory examination." *Something like this is what I want for our present inquiry*...Now uncover another part of your mind, Protagoras. What is your attitude toward knowledge?[2]

Whenever Plato's Socrates uses the metaphors of the midwife or the physician, he is always careful to distinguish (by means of a disanalogy) between those arts and his philosophical practice. Philosophy is to concern itself with matters of the soul--with knowledge--rather than with the body. This disanalogy has been constitutive of one of the worst mistakes in the Western philosophical tradition: namely, the idea that reason, mind and knowledge are disembodied. In the previous chapter I have argued that Dewey, by beginning his philosophical project with an account of the embodied mind, offers us a far

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[1] Plato *Theaeteus* 150b2-5.

[2] Plato *Protagoras* 352a1-b1.

superior theory of knowledge and a far superior metaphysical picture than that offered by Plato, Socrates, and Aristotle. In this chapter I will continue my discussion of the alternative project by proposing a framework to organize and situate some of the most recent work on embodiment and metaphor within the various cognitive sciences.

As most of this chapter will be a complex technical discussion of contemporary work in the cognitive sciences, it may prove useful to keep in mind the role of this chapter in the larger argument. I began the dissertation with an analysis of how Presocratic philosophical paradoxes are constituted by patterns of embodied metaphoric reasoning. In that first chapter I briefly introduced the notions of conceptual metaphor and the embodiment hypothesis, and I used them in my analyses of how those paradoxes work. I chose to start at the very beginnings of Western philosophy because even the conventional philosophical view that metaphors have almost no role in philosophy acknowledges that the Presocratics, in what it calls their vague fumblings toward what would later become mature philosophical discourse, used metaphors. Though it is the hypothesis that I would eventually end up maintaining, I also pointed out that the claim that philosophy in general was constituted by embodied metaphors was so contrary to the conventional view of what philosophy is as to be laughable.

Over the course of the next two chapters I then explored both how this conventional account came into existence, and how it fails to be accurate. I presented two case studies analyzing the constitutive role of metaphor in generating the arguments of major philosophical texts, Plato's *Protagoras* and Aristotle's *Posterior Analytics*. I chose these texts because both texts provide important illustrations of the conventional view's

twin theses that metaphors are too misleading to be used in serious philosophical inquiry, and that philosophical inquiry is essentially disembodied rather than embodied. In my analysis of the *Protagoras*, I explained how Socrates' repeated use of disanalogical metaphoric inferences led to the ontogenesis of a new rhetorical form, the *elenchus*. Seen from a sociopolitical perspective, I suggested that the *elenchus* might have developed out of the practice of poking holes in the arguments of Greek orators. The heckler's method consisted of first cultivating metaphors into analogies and then by finding a disanalogy which suggested the metaphor was inappropriate.

Despite its affinity to the fine comedic art of political heckling however, Plato has Socrates turn the method of disanalogy to a more serious end. Toward the end of the dialogue, Socrates suggests that as disanalogies reveal that things differ, perhaps it would be better to study the subject only in its own terms (and not using metaphors). I argued not only that Socrates used a pattern of disanalogies to argue for an objectivist metaphysics of knowledge, but that he also used a particular key disanalogy to argue that knowledge was disembodied. Thus I also explained how Socrates set up a complex cluster of metaphors in order to derive a central disanalogical metaphoric inference. As I pointed out, Socrates thinks that knowing differs from seeing in that knowing implies that one is "seeing" things as if one had already measured them. As philosophical seeing differs from ordinary embodied seeing, so the objects of knowledge supposedly differ from the ordinary objects of embodied sight by being disembodied.

Aristotle makes this metaphysics of knowledge and its accompanying injunction against the use of metaphor in philosophical and scientific argumentation even more

explicit. In his philosophy of science, Aristotle sets out the rhetorical form of pure expository prose as the normative standard for philosophical inquiry. However, I showed how Aristotle's conception of what such exposition is to refer to, the natural kinds, is itself constituted by metaphoric reasoning. Given that neither Socrates, Plato nor Aristotle were actually able to escape using metaphors as they generated their metaphysical views, I concluded that the conventional account was mistaken.

As I began the second half of my dissertation I turned my attention to discussing an alternative to this bad metaphysical picture by presenting Dewey's metaphysics of "as" together with his theory of the embodied mind. Now, in this fifth chapter of the dissertation I will be using Dewey's metaphysical picture in part as I develop a framework for research into the embodiment hypothesis, particularly with respect to conceptual metaphor. I will begin this chapter by tracing the history of Lakoff and Johnson's embodiment hypothesis. My purpose here is to explain how the embodiment hypothesis has gradually widened in scope from being originally about some specific linguistic phenomena (conceptual metaphors) to being a general position in cognitive science. I will argue that this widened scope requires a broader understanding of a number of different senses of the term embodiment, including the developmental, the cultural, the phenomenological, the neurophysiological, and the evolutionary dimensions. I will then criticize Lakoff and Johnson's most recent formulation of the embodiment hypothesis as a three-tiered "levels of investigation framework for investigating cognition," and I propose an amended theoretical framework which draws in part from my work on Dewey's metaphysical picture.

I will be using my levels of investigation framework to situate the different kinds of current projects investigating conceptual metaphors, with especial attention to distinguishing two senses of the embodiment hypothesis easily confused: namely, using cognitive neuroscience to investigate the embodied bases of conceptual metaphors, and researching the conceptual metaphors of the theories of cognitive neuroscience. Using one of these projects for background examples, I will explain how the theory of disanalogical metaphoric inferences I developed to handle philosophical texts is also crucial for analyzing scientific theories. I also explain why I believe it to be an important new contribution to conceptual metaphor theory, and situate it against one of the other major new developments in conceptual metaphor theory, Fauconnier and Turner's conceptual blending. Finally, I will conclude this chapter by suggesting that all these different levels of investigation and disparate research projects might cohere in a new rhetorical form and with different metaphors for knowledge. In the following and final chapter of the dissertation, I will then be developing these suggestions explicitly.

The Embodiment Hypothesis: A Brief Historical Introduction

Similar to Dewey's account of the embodied mind in what I have called his metaphysics of "as," the embodiment hypothesis as formulated in recent cognitive science maintains that as meaning, concepts and patterns of reasoning are all grounded in patterns of bodily perception and experience, human knowledge is fundamentally embodied. The route that led to that conclusion in contemporary cognitive science was somewhat

different from Dewey's however, and a brief history of the embodiment hypothesis will prove instrumental as I explain how the embodiment hypothesis has come to have its current formulation.

Before I relate that history, however, it is important to see that the key to formulating the embodiment hypothesis was the discovery in linguistics and philosophy that metaphor is conceptual in nature. Previous traditions, following Aristotelian lines of thought, had generally held that metaphor was not conceptual but merely linguistic and rhetorical. As I traced in the first half of the dissertation, the conventional view held that argumentation and reasoning were supposed to be independent of metaphor. At best metaphor was seen as an optional matter of language or rhetorical style; at worst it was seen as an abuse of language and as detrimental to proper philosophical discourse.

However, the linguist George Lakoff and the philosopher Mark Johnson discovered that conceptual metaphors provide a profound proportion of the structure of human conceptualization and knowledge, and much of our language and reasoning is constituted by the metaphoric structure of underlying conceptual systems. Instead of being a *mere* matter of the optional use (or the downright detrimental abuse) of language in giving rhetorical flourishes to philosophical arguments (as I have shown they were for Aristotle), conceptual metaphors are philosophically important matters of thinking and reasoning. Because they are matters of reasoning, they can be constitutive of philosophical argumentation--one of the major points which I argued throughout the first half of the dissertation. Further, Lakoff, Johnson and colleagues also showed by systematic linguistic surveys that much of human conceptual structure had a unidirectional

character to it. Conceptual metaphors typically project embodied patterns of reasoning onto more abstract and less bodily domains of understanding. This observation of a directionality from the bodily to the abstract would provide the basis for the earliest formulation of the embodiment hypothesis.

Origins of the Embodiment Hypothesis in the Conceptual Metaphor Hypothesis

The conceptual metaphor and embodiment hypotheses were nearly inextricable at the beginning of their recent history. Beginning in the late 1970s[3] with a mass of empirical linguistic examples of metaphor, Lakoff and Johnson discovered that much of the ordinary language we use to characterize a wide variety of experiences is systematically shaped by a relatively small number of metaphors. Their work called into question the traditional distinction between the deeply conventionalized, "dead" metaphors on one hand and the more creative literary "live" metaphors on the other hand. In a series of electrifying examples, they showed that linguistic expressions which were supposed to be "dead metaphors" are in fact part of a larger systematic metaphors which also have very noticeable "live" metaphorical portions. They argued that the "live" metaphorical expressions are the inferential and creative extensions of an underlying metaphor, while the "dead" metaphorical expressions comprise the core of the metaphor--so well understood that they are hardly noticeable to us as we listen to everyday speech. They dubbed this more systematic notion of metaphor "conceptual metaphor" both in order to

distinguish it from the prior tradition of "linguistic metaphor" (or "literary metaphor"), and in order to emphasize that metaphors are a matter of our cognition and conceptual structure rather than a matter of mere language.

Yet the systematicity of conceptual metaphors was neither the most important nor the most controversial discovery stemming from their groundbreaking research. What was even more intriguing was the fact that the relatively small number of conceptual metaphors draw primarily on domains stemming from bodily experience, and that these bodily source domains do the vast majority of the work of structuring more abstract human concepts. In its earliest formulation the embodiment hypothesis came from a generalization about the directionality of projection from the concrete to the abstract exhibited by metaphorical expressions:

> First, we have suggested that there is *directionality* in metaphor, that is, we understand one concept in terms of another. Specifically, we tend to structure the less concrete and inherently vaguer concepts (like those for emotions) in terms of more concrete concepts, which are more clearly delineated in our experience.[4]

In the immediately subsequent section,[5] Lakoff and Johnson then identified three sources of more concrete concepts. They argued the more concrete concepts are the "natural kinds of experience" comprised of "experiential gestalts" more basic than other concepts, as they are the natural products of our bodies, our interactions with the physical

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[3] George Lakoff and Mark Johnson, *Metaphors We Live By* (Chicago: University of Chicago Press, 1980).

[4] Lakoff and Johnson, *Metaphors We Live By*, p. 112. The emphasis on directionality is in the original.

[5] See the section entitled "The Objects of Metaphorical Definition: Natural Kinds of Experience," in Lakoff and Johnson, *Metaphors We Live By*, pp. 117-119.

environment, and our interactions with other people in our culture. Reserving judgment for future research, they also indicated that while some of these natural kinds of experience might be universal, others might very well vary from culture to culture. They explicitly point out that they are using the terms "nature" and "natural" in a sense which encompasses at least the possibility of cultural variation, and not in the sense of the standard "nature/culture" distinction. To their qualification of the term "natural kinds of experience," I would also add that these "natural kinds" of experience differ from the Aristotelian conception of natural kinds in that they are grounded in the multiple human standpoints from which we *experience* the world, not on the classical ground of an idealized standpoint from which all knowledge can be experienced. In any case, Lakoff and Johnson concluded this section by arguing that these more concrete concepts can be used in the "metaphorical definition"[6] of more complex concepts. In short, they argued that these three natural kinds of experience--experience of the body, of the physical environment, *and* of the culture--are what constitute the basic source domains upon which metaphors draw.

Subsequent Elaborations and Extensions of the Embodiment Hypothesis

Over the next twenty years their notions of experientialism, embodiment and a directionality to conceptual metaphor have received much scrutiny, generated much

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[6] Given Aristotle's view excluding metaphors from definition I have already discussed in chapter three, the phrase "metaphorical definition" would be an oxymoron when seen from an Aristotelian perspective.

controversy and consequently received much elaboration. More systematic surveys undertaken during the mid-1980s at the Department of Linguistics in the University of California at Berkeley showed that bodily source domains were prevalent not only for the semantics of English, but also for languages as distant from it as Japanese and Mixtec (spoken by a contemporary Mayan people living in Chiapas, Mexico). However, it is equally important to note that the languages *did* vary in what *particular* bodily source domains were used to understand what particular target domain, and with respect to how these patterns were represented linguistically. For example, Mixtec uses body-part morphemes to indicate the spatial relations performed by prepositions in English, so to say *The stone is under the table* requires saying the stone is proximal to the table's belly (*yuu wa hiyaa cii-mesa / stone the be-located table-belly*).[7] Speakers of Mixtec systematically understand spatial relations by metaphorically projecting body-part orientations onto other entities in the world.[8]

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[7] This Mixtec example is taken from Lakoff's summary of work done on Mixtec by Claudia Brugman in George Lakoff, *Women Fire and Dangerous Things: What Categories Reveal about the Mind* (Chicago: University of Chicago Press, 1987), p. 313.

[8] I should mention an important caveat to Lakoff's formulation of the embodiment hypothesis regarding Brugman's Mixtec evidence. Recently I have become aware of a cross-cultural child language acquisition study by Chris Sinha and Kristine Jensen de Lopez of psychology Department of the University of Aarhus in Denmark. In their work, they investigate whether children learning to speak a closely related Mayan language, Zapotec, in fact acquire these morphemes first as body-part terms and then later metaphorically project them as spatial relations terms. The preliminary analysis of the fieldwork suggests Zapotec speakers in fact acquire them in the reverse order, while Danish and English speakers acquire them in the order Lakoff suggests. If sound, this would be important contravening evidence against the formulation of the embodiment hypothesis as a strong constraint on the directionality of metaphoric projection. However, as they currently hypothesize that the difference in acquisition order derives from differing cultural practices (Zapotec infants spend most of their first two years in a sling on the mother's back, sharing her perspective, while Western children are placed in cribs and carriages and encouraged more to move about on their own), I would argue that this evidence does not argue for a complete rejection of the embodiment hypothesis. Instead, I would argue that it is compatible with a broader formulation of the

With respect to historical semantic change, Eve Sweetser documented a directionality within Indo-European languages for metaphors such as Knowing Is Seeing, arguing that the terms which came to be the ordinary ones for abstractions such as knowing were at an earlier time restricted to embodied perceptual capabilities, such as seeing, grasping, hearing, smelling, tasting, and feeling. To take a philosophically familiar example, she traces the transition of the Indo-European root **weid* (see) through the Greek *eidon* (to see) and, in its perfective form, *oida* (sight, know), to the English terms *idea*, *wit* and *witness*, which retain none of their visual sensibility to most native English speakers.[9] By observing how a wide range of embodied perceptual terms systematically lose their perceptual connotations as they acquire their intellectual meaning, she proposes that there is a constraint on the directionality of semantic change. In the following quote she compares this new constraint with the well-established constraint in linguistics on the directionality of phonological shifts from /*b*/ to /*p*/ and /*g*/ to /*k*/:

> If we are willing to look at such large-scale, systematic historical connections between domains of meaning, it becomes evident that not all of semantic change is as whimsical and perverse as has often been assumed. True, prediction of any individual change remains impossible and seems unlikely to become possible in the future. Phonological and morphological change cannot be predicted on an individual basis either, so surely no one expects specific-case predictions for semantic or syntactic change. However, in many semantic domains it seems possible to determine what would be natural as opposed to unnatural directions of

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embodiment hypothesis based on a directionality of explanation and which emphasizes the cultural situatedness of conceptual metaphor within embodied practices (and not just embodied physiology), such as my "Big Picture" framework I introduce later in this chapter.

[9] Eve Sweetser, *From Etymology to Pragmatics: Metaphorical and Cultural Aspects of Semantic Structure* (New York: Cambridge University Press, 1990). See particularly chapter two, pp. 23-48. My example may be found in the list of evidence on p. 33.

> change, just as in phonology we know that voiced stops would be likely to devoice in final position or to become fricatives in intervocalic position, rather than the other way around.[10]

The direction of semantic change is for languages to utilize terms for perception as terms for knowing, rather than from terms for knowing to terms for perception. We understand knowing as seeing, but not seeing as knowing. Further, as the quote from Sweetser also makes clear, it is by analogy to this form of argument consisting of constraint-based generalizations over a range of phonological phenomena that the embodiment hypothesis is being formulated as a directional constraint over a range of metaphors.

In the 1987 preface to *The Body in the Mind* Mark Johnson presented six converging bodies of evidence for the embodiment hypothesis understood as a directional constraint on meaning. This list included not only cross-cultural research on metaphor and historical semantic change but also work on prototypes in categorization, the framing of concepts, polysemy, and inferential patterns in metaphor.[11] Near the same time, other research in cognitive linguistics (such as Ron Langacker's cognitive theory of grammar as motivated by spatial relations[12]) contributed to an increasing focus on the body's role in shaping linguistic and conceptual structure. In work that also appeared that same year, George Lakoff characterized the experientialism (or experiential realism) at the core of the

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[10] Sweetser, *From Etymology to Pragmatics*, pp. 46-47.

[11] Johnson, *The Body in the Mind: The Bodily Basis of Meaning, Imagination and Reason* (Chicago: University of Chicago Press, 1987), pp. xii-xiii.

[12] Ronald Langacker, *Foundations of Cognitive Grammar*, 2 vols. (Stanford, CA: Stanford University Press, 1987-1991).

embodiment hypothesis as including

> everything that goes to make up the actual or potential experiences of either individual organisms or communities of organisms--not merely perception, motor movement, etc., but especially the internal genetically acquired makeup of the organism and the nature of its interactions in both its physical and social environments.[13]

Experientialism, as Lakoff defined it, was to be in direct contrast with the traditional conception of meaningful thought and reason as the manipulation of symbols that correspond to an objective reality which is independent of the particular kind of embodiment of the organism. By 1987 the embodiment hypothesis had grown to become much more ambitious in scope than in its more humble origins as a generalization about the directionality of metaphors.

In particular, the idea of embodied "experiential gestalts" as the natural kinds of experience needed further explanation. Building on work done at Berkeley by Len Talmy[14] on the role of force-dynamic patterns in shaping syntactical constructions, Mark Johnson developed a theory of *image schemata.* He defined an image schema as a recurrent pattern, shape or regularity in, or of, our actions, perceptions and conceptions. He argued that "these patterns emerge primarily as meaningful structures for us chiefly at the level of our bodily movements through space, our manipulation of objects, and our perceptual interactions."[15] For example, the containment schema structures our regular

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[13] Lakoff, *Women, Fire and Dangerous Things*, p. xv.

[14] Leonard Talmy, "Force Dynamics in Thought and Language," *Chicago Linguistics Society 21, Pt 2: Possession in Causatives and Agentivity,* 1985, pp. 293-337.

[15] Johnson, *The Body in the Mind*, p. 29.

recurring experiences of putting objects into and taking them out of a bounded area. We can experience this pattern in the kinesthetic modality with physical containers, or we can experience this pattern visually as we track the movement of some object into or out of some bounded area or container. These patterns can then be metaphorically extended to structure non-physical, non-tactile and non-visual experiences. In a particularly striking set of examples, Johnson traced many habitual notions of containment we might experience during the course of a typical morning routine: We wake up *out of* a deep sleep, drag ourselves *up out of* bed and *into* the bathroom, where we look *into* the mirror and pull a comb *out from inside* the cabinet. Later that same morning we might wander *into* the kitchen, sit *in* a chair at the breakfast table and *open up* the newspaper and become lost *in* an article. Some of these experiences are spatial and physical but do not involve the prototypical containment image schema (as in the example of sitting in a chair) while some of these experiences draw on purely metaphorical extensions of containment (as in the example of getting lost in the newspaper article).

Such image schemata are *preconceptual* embodied structures of meaning in at least two important ways. First, image schemata are developmentally prior to conceptual thinking, at least insofar as conceptual structure is accessible to us by means of language. Johnson drew on work by the developmental psychiatrist Daniel Stern. Stern argues that the activation, build-up and release of emotional tension is among the earliest and most foundational of our prelinguistic experiences:

> For instance, in trying to soothe the infant the parent could say, "There, there, there ..." giving more stress and amplitude on the first part of the word and trailing off towards the end of the word. Alternatively, the parent could silently stroke the

> baby's back or head with a stroke analogous to the "There, there" sequence, applying more pressure at the onset of the stroke and lightening or trailing it off toward the end ... the infant would experience similar activation contours no matter which soothing technique was performed.[16]

As infants we experience these patterns of feeling (image schemata) before we develop a linguistic self, and these image schemata are not unique to any one perceptual modality but have a structure which is shared across them.

Second, Johnson argues that image schemata are preconceptual in that they can underlay multiple different conceptual metaphors. We can extend--by means of metaphor--these directly emergent experiences to characterize non-spatial experiences such as falling *into* a depression or getting lost *in* the newspaper. Further we can project the inference patterns of the containment schema into the metaphorically structured domain. For example, just as we reason that the deeper an object is in a container it will be harder to get it out, we reason that the deeper someone is in a depression the harder it will be to get them out of their depression. It is important to see that image schemata serve as the preconceptual basis for metaphors in both a developmental and structural sense. The embodiment hypothesis is not only a hypothesis about how image schemata and conceptual metaphors structure adult cognition, but about the ontogenetic acquisition of metaphoric structure as humans develop from infants to adults.

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[16] Daniel Stern, *The Interpersonal World Of The Infant* (New York: Basic Books, 1985), p. 58. See also Andy Meltzoff's "Molyneux's Babies: Cross-modal Perception, Imitation and the Mind of the Preverbal Infant" in *Spatial Representation: Problems in Philosophy and Psychology* (Cambridge, MA: Blackwell, 1993), pp. 219-235.

Though calling patterns which are supposed to be cross-modal "images" may seem to be a little misleading, Johnson fortuitously chose the term "image schemata" in accordance with burgeoning research in the cognitive sciences on the role of images in our embodied mental conceptualization. In the early 1970s the psychologists Shepard and Metzler asked experimental subjects to determine whether a pair of two-dimensional pictures of three-dimensional objects were identical. They discovered that subjects rotated these objects mentally at a fixed speed of approximately 60 degrees each second, suggesting that humans manipulated the images as a unit. Their discovery touched off a powder keg of controversy,[17] as the prevailing view of the mind as a symbol manipulation system favored a theory in which perceptual images were decomposed into image-independent propositional representations, much as they would be represented in the computers of that time.

Shepard and Metzler's original work on visual imagery was one of the key factors which led to a revolution in the cognitive sciences' conception of mind and brain as organized in terms of image-like wholes, a revolution that was most dramatically borne out by convergent evidence from cognitive neuroscience. In particular, researchers using neuroimaging and neuroanatomical techniques have been able to isolate regions of the brain which depict perceptual images, visual imagery, and spatial (i.e. non-visual or tactile)

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[17] For a brief summary of this controversy see Lawrence Barsalou, *Cognitive Psychology: An Overview for Cognitive Scientists* (Hillsdale NJ: Lawrence Earlbaum Associates, 1992), pp. 109-112. For more thorough treatments see Steven Kosslyn's books *Image and Mind* (Cambridge, MA: Harvard University Press, 1980) and *Image and Brain: The Resolution of the Imagery Debate* (Cambridge, MA: MIT Press, 1994).

imagery as topographically mapped images. As the Shepard and Metzler results suggest, humans have topographically mapped neural circuitry for the visual perception and the visualization of spatial form. Similarly, the neurosurgeon Wilder Penfield discovered that the somatosensory and motor regions of the cerebral cortex topographically map the body. Such image-like maps are considered to be topographic because they preserve the contours of perceptual experience.

Similar topographic maps have been found for the other sensory modalities, such as pitch maps for auditory experience. We do know that these topographic maps are refined into more selective maps which respond to higher order and more selective kinds of contour patterns, but the current state of cognitive neuroscience stops short of specifying maps of the particular sets of contour patterns Johnson identifies as image schemata, especially when considered as cross-modal perceptual structures. At present the possible neurobiological instantiations of image schemata, even as to their basis in just one perceptual modality, remain an intriguing area for future research. I should also note that some progress has been made in neurocomputational modeling, for example, Terry Regier[18] has constructed structured connectionist networks of various image schemata using computational analogues to the neurobiology.

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[18] Terry Regier, *The Human Semantic Potential*, University of Chicago Press, 1995.

Contemporary Formulations of the Embodiment Hypothesis

However, it is crucial to see that the embodiment hypothesis is much more than the simpleminded argument that our conceptual structure must have *some* neural instantiation. Introducing their most recent formulation of the embodiment hypothesis, Lakoff and Johnson observe that while even the traditional view of the disembodied mind maintains that minimal position, the embodiment hypothesis goes much farther:

> Advocates of the disembodied mind will, of course, say that conceptual structure must have a neural *realization* in the brain, which just *happens* to reside in a body. But they deny that anything about the body is essential for characterizing what concepts are.[19]

The embodiment hypothesis lifts its present argumentative form from an analogy to work in cognitive science which argues that conceptual and perceptual processes share many of the same neural subprocesses.

To see the analogy, consider some more examples drawn from the literature on mental imagery. In an experiment designed by Stephen Kosslyn and colleagues, the subjects were either (i) asked to form a mental image within a grid on a computer screen or (ii) presented with an equivalent visual image on a computer screen. By comparing the two experimental conditions in a PET study, these researchers were able to show that many of the same areas of the brain were active both under the imagery and the perceptual task conditions. Researchers working on the neuroanatomical processing of visual

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[19] George Lakoff and Mark Johnson, *Philosophy in the Flesh* (New York: Basic Books, forthcoming 1998), ch. 3.

perception have long argued that visual perception processing splits into two major pathways. The visual perception of spatial form, or "whatness," is processed in a ventral stream while locating an object in the visual field, or "whereness" is processed by a dorsal stream, and various topographic maps indicating form and position can be found in areas along these pathways. The Kosslyn group's results show clearly that a "top-down" volitional task such as mental imagery (visualization) utilizes these same subprocesses as a "bottom-up" task like visual perception. After summarizing this research together with many other related studies, Michael Posner and Marcus Raichle conclude "it is clear that elements of the "what" and "where" pathways within the visual system can be engaged in forming visual imagery."[20]

This idea of shared bodily subprocesses which underlie both cognition and perception is at the core of the present formulation of the embodiment hypothesis. The analogy between the form of the argument for the embodiment hypothesis and the form of the foregoing argument about visual imagery and visual perception can be made explicit: Just as visual imagery shares and builds upon the processes the brain and body use to perceive visual images, so conceptual structure generally shares and builds upon perceptual processes. Of course the argument that *per*ceptual and *con*ceptual structure share the same subprocesses is much more ambitious in scope than the foregoing argument about two kinds of tasks which take place in one modality (i.e. vision). However, Lakoff and Johnson currently formulate the embodiment hypothesis in precisely

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[20] Michael Posner and M. Raichle, *Images of Mind* (New York: Scientific American , 1994), p. 97.

this fashion:

> The embodied mind hypothesis therefore radically undercuts the *per*ception/*con*ception distinction. In an embodied mind, it is conceivable that the same neural system engaged in *per*ception (or in bodily movement) plays a central role in *con*ception. That is, it is possible that the very mechanisms responsible for perception, movements, and object manipulation could be responsible for conceptualization and reasoning."[21]

What is crucial to the argument of the embodiment hypothesis is that the *same* neural mechanisms which are responsible for "lower level" activities like perception and movement are taken to be *essential* to "higher level" cognitive abilities, namely to our reasoning and conceptualization. Thus on their view Lakoff and Johnson argue "that the very properties of concepts *are created* as a result of the way the brain and body are structured and the way they function in interpersonal relations and in the physical world."[22] The way these properties are created is by means of conceptual metaphors which project cross-domain image schematic patterns which in turn are drawn from the more specific structures within visual perception, locomotion, object manipulation, and so on. At some of the "top levels" of analysis--studies on language and categorization in linguistics and philosophy--the research which has already been done on the metaphorical structuring of concepts strongly implies that the embodiment hypothesis is, in a very general sense, correct. There is considerable evidence that we do categorize and organize our linguistic structure in ways which are shaped by these kinds of phenomena. What

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[21] Lakoff and Johnson, *Philosophy in the Flesh*, ch. 3.

[22] Lakoff and Johnson, *Philosophy in the Flesh*, ch. 3.

remains to be done, however, is the project of establishing how *specific* neural mechanisms are recruited to provide that conceptual organization and how they develop and vary in differing physical environments and cultures.

While actually accomplishing that project involves doing much experimental work which is well beyond the scope of this dissertation, in the rest of this chapter I want to outline how I think this project can be best accomplished. In particular I want to offer a specific theoretical framework--drawing in part on contemporary theoretical work in cognitive science and in part on Dewey's metaphysical picture--for how the various cognitive sciences can best proceed to tackle this part of the embodiment hypothesis. The rest of this chapter consists of two major parts. In the first I set out a framework of the multiple levels of investigation in the embodiment hypothesis and trace out the current state of the study of conceptual metaphor across studies at these multiple levels of investigation. In the second I use that framework to argue that we should make a functional distinction between finding the embodied bases for conceptual metaphor and important related projects that investigate the role of conceptual metaphor in formulating research hypotheses within the cognitive sciences. Analyzing the conceptual metaphors in various theories of contemporary cognitive science is not the same project as searching for psychological, neural and other scientific bases for conceptual metaphor using the methods of the cognitive sciences. Because they are sometimes confused, it is important to have a theoretical framework that can both distinguish the differences between these two projects and situate them relative to one another.

The Multiple Levels of Investigation

Senses of the Term "Embodiment"

Probably the single most important observation I can make about "embodiment" is a flatly descriptive one, and thus is fortunately a relatively easy one to make. The term "embodiment" can be used in at least seven different important senses with respect to our cognition. As theorists often (and sometimes appropriately) conflate these senses, it is important to get a clear picture of as many the different dimensions of variation we can indicate by the term. I would not claim that this list is entirely exhaustive of the term's current usages, nor that these dimensions I identify here are necessarily entirely independent of another and distinct from one another. But this list is intended to catalogue the usages of the term in a way that shows a number of the most relevant dimensions to which a general theoretical framework for the embodiment hypothesis must be responsive.

1. In a very general sense, embodiment has a *phenomenological* meaning in that it can refer to the things we notice about the role of our bodies in shaping our self-identities and our culture through acts of conscious and deliberate reflection on the lived structures of our experience. Examples of this type of project range from linguistic analyses of the conceptual metaphors we

ordinarily use in some area of culture like politics, philosophy or ethics,[23] to the various insightful philosophical accounts of feminist writers who have discussed how self-identities are formed by cultural expectations about body image.[24] I call these methods phenomenological analyses of embodiment because they are primarily gained through introspection and other methods of conscious reflection.

2. By contrast, embodiment can also mean what Lakoff and Johnson have recently called the *cognitive unconscious*. Here embodiment refers to the ways in which our thought is shaped by many processes below the threshold of our active consciousness, usually as revealed through experimental psychology. For example, psychologists[25] have found that when subjects are presented with a passage structured by a conceptual metaphor, and are then asked to indicate

limited to observations on adult human cognition, as researchers are naturally

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[23] Mark Johnson, *Moral Imagination: Implications of Cognitive Science for Ethics* (Chicago: University of Chicago Press, 1993), George Lakoff, *Moral Politics: What Conservatives Know But Liberals Don't* (Chicago: University of Chicago Press, 1996), Tim Rohrer's "Conceptual Blending on the Information Highway: How do metaphorical inferences work?" in *Discourse and Perspective In Cognitive Linguistics*, (Amsterdam: John Benjamins, 1997), "The Metaphorical Logic of (Political) Rape: George Bush and the New World Order," *Metaphor and Symbolic Activity*, (v. 10, 1995, pp. 113-131), "To Plow the Sea: Metaphors for Regional Peace in Latin America," *Metaphor and Symbolic Activity*, (v. 6, 1991, pp. 163-181), "Historical Inevitability and the Information Highway: How Metaphors Shape Science Policy" in *Metaphern, Medien, Wissenschaft* (Mannheim, Germany: Westdeutscher Verlag, Institut für Deutsche Sprache, 1997).

[24] For example Susan Bordo's *Unbearable Weight: Feminism, Western Culture and the Body* (Berkeley, CA: University of California Press, 1993).

[25] Raymond Gibbs, *The Poetics of Mind: Figurative Thought, Language, and Understanding* (New York: Cambridge University Press, 1994).

when they comprehend a final sentence either constructed from the same conceptual metaphor system, or from a relatively non-metaphoric, literal context, the subjects react more quickly to the metaphoric sentence than to the less metaphoric sentence. Though we can consciously attend to them, we normally process conceptual metaphors automatically and unconsciously. Or, to take second example of the cognitive unconscious which is less tied to the conceptual metaphor hypothesis, when you read these words you do not consciously identify each letter by shape. Rather you "chunk" these letters together into words and the words into sentences with relative ease. If we were not able to do this--if we had to attend consciously to every minute detail of our perceptual world--we would not be able to walk without looking at and concentrating upon our feet, much less read the newspaper at the same time. Human beings are very efficient chunkers of perceptual information.[26] Much of our life is shaped by embodied processes below the level of our conscious, directed attention.

3. In fact neuroscientists have localized the chunking of letters in words to particular regions of the brain, which is an observation that leads to the third sense of the term. In this *neurophysiological* sense, the term embodiment can refer to the particular neural structures and regions which accomplish feats like chunking. This sense differs from the cognitive unconscious level in that it

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[26] For an overview of the evidence for chunking see Barsalou, *Cognitive Psychology*.

privileges the physical instantiation of those processes. One important limitation of this approach to understanding our embodiment is that it is usually more apprehensive about exposing infants and children to novel neuroimaging research techniques.

4. Thus in yet another important sense embodiment can refer to the *developmental* changes that the organism goes through as it transforms from zygote to fetus, or from child to adult. Neither our physiological, nor our neurophysiological, nor our organismic embodiment is the same throughout our lives. For example, Johnson's notion of image schemata draws upon developmental evidence for an embodied crossmodal or supramodal system as a preconceptual basis for language.[27]
5. Another important sense of the term "embodiment" refers to the *evolutionary* course of development the species of organism has undergone throughout the course of its genetic history. Human beings have presumably not always had a language capability, and so evidence from studies on the evolutionary dimension of embodiment may often prove crucial to understanding why, for example, language processing in the brain does not appear to be exclusively concentrated as an autonomous module but instead draws on numerous

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[27] See for example Meltzoff "Molyneux's Babies," Stern *The Interpersonal World of the Infant*.

subsystems from the perceptual modalities.[28]

6. There are two senses of the term embodiment remaining which as particularly important to the literature on conceptual metaphor. A particularly influential sixth sense of "embodiment" stems from Lakoff and Johnson's strong formulation of the embodiment hypothesis as being a constraint on the *directionality of metaphor mappings*. In this strong directionality constraint they claim that we normally project image-schematic patterns of knowledge unidirectionally from a more embodied source domain to understand a less well understood target domain. However, I think there are actually two senses of embodiment here. In its original formulation the embodiment hypothesis was first stated as a generalization about the kinds of basic conceptual domains which were generally serving as source domains, rather than as explicitly referring to the directionality of projection for every element within a particular metaphor.[29] Later in this chapter I will propose that the feedback from disanalogous inferences of the kind I have been presenting throughout this dissertation imply that we ought to separate, as two different senses of embodiment, the directionality of the individual mappings within a metaphor

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[28] See Terrence Deacon, *The Symbolic Species: The Co-evolution of Language and the Brain,* (New York: W. W. Norton, 1997) and Gerald Edelman, *Bright Air, Brilliant Fire: On the Matter of Mind* (New York: Basic Books, 1992) for excellent introductions to evolutionary senses of embodiment.

from the directionality involved in choosing appropriate source domains for explanation. I believe this distinction is a particularly important clarification for research in this tradition, as the conflation of these two issues has been the focus of many disputes within the literature on conceptual metaphor.[30]

7. Thus the seventh important sense of embodiment is one which I will be proposing toward the end of this chapter. To briefly outline the key points, I will be arguing that the constraint on the directionality of the individual mappings within a conceptual metaphor can be dissociated from the *directionality of explanation.* By the directionality of explanation I simply mean that when we give an explanation, we explain less well understood target domains in terms of more familiar source domains, and not vice versa. As the directionality of explanation does not say anything about requiring that all the projection within a metaphor mapping be unidirectional, making this distinction also has the advantage of setting the directionality of explanation apart from the debate surrounding the target-to-source feedback effects of disanalogy on metaphor mappings. Thus I argue that making the distinction between the

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[29] I have cited the key passage earlier as I gave a history of the embodiment hypothesis but it is worth quoting again to make my point clear: "First, we have suggested that there is *directionality* in metaphor, that is, we understand one concept in terms of another. Specifically, we tend to structure the less concrete and inherently vaguer concepts (like those for emotions) in terms of more concrete concepts, which are more clearly delineated in our experience" (Lakoff and Johnson, *Metaphors We Live By*, p. 112).

[30] For example, see the invariance hypothesis debates. George Lakoff "The Invariance Hypothesis: Is Abstract Reason Based on Image-Schemas?" *Cognitive Linguistics*, v. 1, n. 1, 1990, pp. 39-74, Claudia Brugman "What is the Invariance Hypothesis?" *Cognitive Linguistics*, v. 1, n. 2, 1990, pp. 257-266, Mark Turner, "Aspects of the Invariance Hypothesis," *Cognitive Linguistics*, v. 1, n. 2, 1990, pp. 246-256.

directionality of the explanation and the constraint on the directionality of metaphor mappings preserves the embodiment hypothesis' appeal as a theory of how we explain more complex concepts in terms of simpler ones.

I should mention again in closing that this list is not meant to be entirely exhaustive of the usages of the term "embodiment," but rather to illustrate that the scope of the embodiment hypothesis requires thinking through evidence drawn from a multiplicity of perspectives on embodiment, and from multiple methodologies.

The Embodiment Hypothesis in Cognitive Science: Previous Theoretical Frameworks

This subsection primarily discusses flaws and weaknesses in the proposals for incorporating the various senses of embodiment listed into a coherent theoretical framework, but it is also written with an eye to specifying how that framework might be eventually be filled out with respect to conceptual metaphor. In order to investigate the role that conceptual metaphor plays in cognition, it is necessary to consider how the questions posed both change and stay the same as various philosophical and scientific methods of inquiry are brought to bear on the phenomena. Telling a coherent story about a topic as broad as this requires achieving a kind of vertical convergence of evidence from many interrelated studies across multiple disciplines. However, this does not necessarily mean that this convergence will ultimately reduce to a single unified story. Just as with Dewey's account of the multiple "reals of experience" which result from a careful inclusion of the initial conditions and methodological biases implicit in an experimental

standpoint, there will be knowledge specific to each level of investigation because the results are results found by knowers tackling specific problems and who work within a specific methodology which uses constructs appropriate to that level of investigation.

For an example of the non-reductiveness of this approach, consider a treatment of the reality of theoretical constructs in this passage from Lakoff and Johnson:

> Phonemes and verbs are real. They are entities in language. Of course, no one who takes these as real thinks that they are physical entities. We take them as real because they are required if we are to make sense of the nature of language. Any explanatorily adequate theory of language will have to posit them. That is, they are real relative to an understanding, in this case, a scientific understanding of language.[31]

Taking nouns instead of verbs as an equivalent example of a linguistic category, I want to make clearer Lakoff and Johnson's point about the necessity of real, independent constructs in different scientific disciplines. An attempt to find the neural instantiation of "nouns in the brain" is highly unlikely to carve out precisely the same unit of lexical constructs that linguistics does. In current neurological studies of people who have brain lesions which inhibit their ability to retrieve nouns, those people typically show highly selective deficiencies along multiple lines of inquiry. Patients with lesions in one area of the brain have trouble understanding nouns presented in written form, those with damage in another different region may have trouble retrieving nouns when presented with visual pictures of them as a prompt for the noun, while a third kind of deficiency has been isolated to yet another region where damage produces an inability to speak nouns. Nor do

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[31] Lakoff and Johnson, *Philosophy in the Flesh*, ch. 7.

the twists and turns of the neurophysiological evidence end here. The lines of inquiry at this level also multiply in yet another surprising way: nouns are organized in parallel systems in these regions according to certain categories. For example, some patients may be able to retrieve nouns for persons but not for tools.[32] These kinds of discovery on the neurophysiological level lead in turn to speculation about whether such noun categorization is reflected in linguistic structure.

The moral of this example is twofold. First, the constructs considered real at one level of investigation may prove to be too crude at another level of investigation. Second, the interaction between differing constructs at different levels of investigation can produce new hypotheses for investigation at another level. For example, the discovery that there were separate neuroanatomical pathways in the visual system responsible for color, shape and motion perception was a part of what led to psychological experiments investigating whether the visual attentional focus could be split along these lines.

In order to clarify how we can best track a phenomenon like conceptual metaphor through all these different levels of cognition, I am going to adapt a general theoretical framework commonly used in the cognitive sciences known as the multiple levels of investigation framework. I have already been using terms such as "top level," "lower levels" and "level of investigation" as I presented the embodiment hypothesis, but it is important to present a general framework of what constitutes these levels of investigation.

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[32] For a cogent summary see Alfonso Caramazza's "The Brain's Dictionary" in *Nature* (v. 380, 11 April 1996), pp. 485-86. The PET studies are found in Hanna Damasio et al., "A Neural Basis for lexical Retrieval," *Nature*, v. 380, 11 April 1996, pp. 499-505.

In this general framework we acknowledge that each discipline has methods of investigation appropriate to it which produce results specific to that level of investigation and, although the scope of the different methods entails that the questions asked are different at the each level, we can learn from a concerted effort to try to tie multiple levels of investigation together. Instead of organizing these disciplines into an Aristotelian hierarchy of subsciences, sciences and superscience, this framework organizes those multiple levels of investigation as independent sciences but with interrelated concerns. As I have already shown in the previous two examples, these interrelated concerns ensure that evidence can give shape to research hypotheses at another level of cognition.

However, at this point the specific frameworks characterizing these levels of investigation proposed by a variety of theorists diverge, primarily according to which criteria are used to organize the frameworks. Perhaps the two most basic criteria are methodology and physical size. First, the levels of investigation may be sorted according to the differing types of methodologies used in investigating cognition, including such methods as neurological diagnosis, linguistic analysis, reaction time studies in cognitive psychology, neuroimaging techniques which map blood flow events within the brain such as positron emission tomography (PET), magnetic resonance imaging (MRI) and functional MRI, neurocomputational models, the use of chemical dyes in neuroanatomy to stain various multicellular and cellular structures for study, and the electro-cellular recording of neural impulses. Second, the levels of investigation may be sorted according to a scale of the relative sizes of the bodies producing the phenomena under investigation, which can range from a culturally situated interpersonal scale (greater than 1 meter) down

to the molecular, electrical and physical properties of neural transmitters (less than 10^{-5} m).

Efforts to organize the levels of investigation by a scale of the relative sizes are of particular interest because they provide a basis for the commonly used orientational metaphors of "top levels," "higher level," "bottom levels," and "lower levels" in cognitive science, as an organism's complexity generally increases with relative size. Thus the more neural investigations are toward the bottom of this scale, while linguistic, psychological, philosophical and other more cultural investigations tend toward the top end of the scale, as they require full-fledged nervous systems of 1 to 2 meters in size. However there are other (and sometimes misleading) bases for this orientational metaphor, including a very value-laden traditional conception of "higher-order" cognition as the volitional and cognitive capacities of supposedly "superior" creatures, such as humans. The cognitive sciences still retain traces of this conception, especially in the customary conceptions of volitional activity (i.e. the mental imagery tasks already discussed) as "top-down" activities while sensory and perceptual activities (i.e. visual imagery) are supposed to be "bottom-up."

While it undoubtedly would be worthwhile to examine in detail many of the proposed frameworks to sort out these levels, I want to outline only briefly some of the major positions before discussing the most recent framework that Lakoff and Johnson present and then the framework which I think can best guide research in the embodiment hypothesis. The range of proposed criteria to organize these multiple levels of investigation includes: a scale based on the relative physical sizes of the physiological

systems which produce the events studied (the Churchlands),[33] different complexities of tasks given to experimental subjects (Posner and Raichle),[34] the kinds of computational models used in simulating cognitive and neural behavior (Marr and Poggio; [35] a scale based on evolutionary time scales (Edelman),[36] and a scale based the organism's individual developmental course (Edelman).[37] The exact terminology chosen often varies slightly in telling ways--Marr and Poggio prefer levels of "analysis," the Churchlands prefer levels of "organization," while I follow Posner in using levels of "investigation"--but the basic problem of bridging gulfs between different methodological projects remains constant.

Lakoff and Johnson's Current Framework for Research into the Embodiment Hypothesis

Because I see the multiple levels of investigation as closely allied with the physical size of the physiological systems which produce the data to be studied, I have some concern about the limitations of Lakoff and Johnson's recent proposal of three theoretical

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[33] Patricia Churchland, *Neurophilosophy: Toward a Unified Science of the Mind-Brain*, (Cambridge, MA: MIT Press, 1986).

[34] Posner and Raichle, *Images of Mind*, p. 97.

[35] David Marr, *Vision: A Computational Investigation into the Human Representation and Processing of Visual Information* (San Francisco: W. H. Freeman, 1982). Werner Reichardt and Tomaso Poggio, eds., *Theoretical Approaches in Neurobiology: Based on a Work Session of the Neurosciences Research Program*, (Cambridge, MA: MIT Press, 1981).

[36] Edelman, *Bright Air.*

[37] Edelman, *Bright Air.*

levels of investigation for research into the embodiment hypothesis.[38] In introducing a research program known as "The Neural Theory of Language" (NTL) Lakoff and Johnson write that:

> The research paradigm of The Neural Theory of Language Group at Berkeley (the NTL paradigm) is a multi-level paradigm, in which each level contributes something necessary to explanation in cognitive science.[39]

So far, so good. Next they introduce the three general levels of investigation in cognitive science as the cognitive, the neurocomputational, and the neurobiological (listed here in a top to bottom order). About these they write:

> In this paradigm, the top level is a description of cognitive structures and mechanisms in functional terms. It includes such notions as phonemes, verbs, and concepts. The bottom level is a description of the neural system of the brain in biological terms. It includes such notions as ion channels, axons, dendrites, synapses, and so on. The role of the neurocomputational level is to link the two: To model the neural structure of the brain or some aspect of it, while using that model to account for aspects of thought, language, and other cognitive functions.[40]

The basic difficulty I have with this three-tiered framework is that it oversimplifies

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[38] There are actually two separate proposals (of three levels apiece) related to the embodiment hypothesis in chapter seven of Lakoff and Johnson's final draft of *Philosophy in the Flesh*... The first concerns the levels of embodiment: the phenomenological, the cognitive unconscious and the neural. The second are the cognitive, the neurocomputational and the neurobiological. As they make it clear that it is in the second case that they are drawing on a "common paradigm" in cognitive science, I am going to treat this account as their attempt to provide a framework of the theoretical levels of investigation. However, I do think that some of the material that they present under the first sense ought to be incorporated into the overall model, and in the framework I present later in this chapter I have done so. Johnson reports (personal communication) that the cognitive level of the second triad covers both the phenomenological and the cognitive unconscious levels given in the first triad. Finally there is a third and expanded proposal detailing five levels of investigation in the appendix devoted to the Neural Theory of Language work. I will discuss this third proposal later in this same section.

[39] Lakoff and Johnson, *Philosophy in the Flesh*, ch. 7.

[40] Lakoff and Johnson, *Philosophy in the Flesh*, ch. 7.

by not doing justice to many of the dimensions of embodiment I have set out. However, as some simplification is necessary to the enterprise of neurocomputational modeling and in as much as Lakoff and Johnson acknowledge most of their own oversimplifications, it will take me some time to extract the content of my precise criticism from this general problem in a fair and unambiguous fashion. But it may be helpful to keep in mind during the following discussion that my ultimate criticism about their framework will be that to argue that neurocomputational modeling is better considered as a kind of methodology which applies to multiple levels of investigation rather than as a level of investigation in itself. I should also make it clear that I think the NTL project itself is well-conceived and represents the cutting edge of current research on these matters; and though it may briefly appear to be otherwise in the following discussion, my real objective is to redress the poverty of the theoretical framework, not the wealth of the substantive work.

First, there is a rhetorical problem with the presentation of the three-level framework I have just quoted. This presentation makes it sound as if we can use neurocomputational modeling to jump directly some very small-scale subcellular structures of neurobiological organization--neuromolecular models of ion channels, and neurocellular structures like axons, and dendrites--to higher cognitive functions like language and conceptualization. The problem here is that this initial presentation skips over the many intermediate levels of neural systems such as cellular columns, topographic maps, and neural regions, all of which are supercellular and not cellular or subcellular phenomena. Given that some of these supercellular neural structures even play important roles in the details of the very neurocomputational models they report on in more detail in an

appendix, this is clearly an oversimplification that results more from the rhetorical strategy than from a failure to model such intermediate phenomena.[41]

To some degree I think that one source of this problem is undoubtedly Lakoff and Johnson's rhetorical strategy of providing a straightforward introduction to some very difficult ideas about how one can link together some very disparate areas of research taken in by the scope of the embodiment hypothesis, while postponing the discussion of many of the technical details in an appendix. To the extent that this problem of oversimplification can be considered as stemming from choices made for the purposes of the introductory presentation, then the details given in their expanded account in an appendix concerning the three specific neurocomputational models done by members of the NTL group (Regier, Bailey, and Narayanan) begins to alleviate the problem of oversimplification.

Yet, although the presentation in the appendix is much more detailed, I end up having the same basic difficulty with the oversimplifications in their theoretical framework in the appendix as well. A second source of my difficulty here is that oversimplification is endemic to the enterprise of neurocomputational modeling in general. The basic metaphor behind neural computation suggests that we can construct analogues of some small-scale neurobiological structures (for example, triangle cell neurons are modeled as "neural gates") and then connect these analogues together in such a way that they simulate higher-level cognitive behaviors. Models are not intended to be exact copies of every detail of

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[41] Regier, for example, explicitly makes use of structures such as topographic fields like center-surround fields to achieve his results. See his *The Human Semantic Potential*.

the neural circuitry they model; they necessarily oversimplify or they would not be models. Further, there are a number of differing approaches within neural network modeling which vary in how tightly and in what ways the models constrained by neural architectures. In my view, the hybrid variety of structured connectionist models that Regier uses in his NTL research is an improvement on more garden-variety connectionist networks because structured connectionist models are constrained by their models of the intermediate levels of neural organization as well as neurocellular architectures.

However, I think that the amount of oversimplification necessitated by neurocomputational modeling should be minimized by realizing that modeling cognitive behaviors neurocomputationally works best when those behaviors are situated at a level of investigation which is as closely linked as possible to the level of physiological organization of the particular neural systems being modeled.[42] By this standard, the small-scale neurocomputational models of computational neuroscience are considered the best examples of successful explanations, while those structured connectionist networks which seek to closely emulate neural systems of slightly higher orders of magnitude are not far behind. But as the details given in the appendix devoted to the NTL models make clear, only one of three specific models (Regier's) they discuss is a structured connectionist network which uses close analogues of neurobiological structures like orientation-tuning cells and topographic maps. By contrast, Lakoff and Johnson report that the models of Narayanan and Bailey use neurocomputational systems which have only been shown to be

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[42] Churchland, *Neurophilosophy*.

reducible in principle to structured connectionist networks.[43] In their current implementation, the other two models are just not as closely modeled upon the organization of the neural systems that they seek to emulate as Regier's model was.

By now it should be clear that I am not simply criticizing the size of the leap from a neurobiological level to a cognitive level (though this is certainly a part of the problem I have with the presentation of their theoretical framework), but that I am also pointing out a general problem about the relationships between neurocomputational models on one hand and neurobiology and cognition on the other. Let me discuss the point about the size of the leap first, as in the appendix devoted to further elaboration of the NTL research projects Lakoff and Johnson expand the numbers of levels in their theoretical framework from three to five. Though they are clearly well aware of the problems inherent to the leap from neurobiology to cognition, consider how they restate their own position:

> Going directly from the level of cognition to the level of neurobiology is a giant step. The strategy of the NTL group at Berkeley is to break the giant step of neural computation down into three levels so that the task becomes more manageable. The result is a five-level paradigm developed by Feldman and his students David Bailey and Srini Narayanan.[44]

In this operational framework, three more specific levels are proposed to replace the generalized neurocomputational level sandwiched between cognition and neurobiology. These more specific levels are neurally reducible conventional computational models, structured connectionist models, and computational neuroscience.

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[43] Lakoff and Johnson, *Philosophy in the Flesh*, appendix.

[44] Lakoff and Johnson, *Philosophy in the Flesh*, appendix.

Unfortunately, this account of five levels is not any more satisfying than the initial three-leveled account. What is particularly unhelpful here is that even when Lakoff and Johnson provide more levels of investigation, the proposed levels are simply variations in the kinds of computational models admitted into the explanation--and are not even variations which rigorously model the neurophysiology at the many multiple intermediate levels of neurophysiological organization. In short, I think that unless Lakoff and Johnson were to be arguing that the neurally reducible computational models are not only more manageable from the designer's point of view, but are also more like the way cognition works in either the brain or the mind, the five-level framework is not significantly different from the three-level framework.

Of course Lakoff and Johnson do not think that that is the case with the neurally reducible conventional computational models. As they candidly acknowledge, the kind of neurocomputational models done by the NTL group leave unanswered the much more interesting questions of precisely *how* perception, image schemata, conceptual metaphor mappings, linguistic structure and conceptual structure come together in the neurophysiology of the brain. These models are intriguing first steps toward understanding how language and conceptual structure are embodied, but the modeling which works out the much more specific neurophysiological structures underlying a conceptual metaphor mapping still remains to be done.

The criticism at which I am driving is that the three-tiered (or the five-tiered) theoretical framework for the embodiment hypothesis Lakoff and Johnson propose is misleading in positing neurocomputational modeling as a *level* of investigation. By

contrast, in the broader theoretical framework which bases its conception of levels largely on a scale of physical size that I will propose in the next subsection of this chapter, I argue that neurocomputational modeling is better considered as a *methodology* rather than as its own level of investigation. As a methodology, neurocomputational models should be focused on the particular neural structures at the neurobiological level they model. As such, neurocomputational modeling is not a level which links between neurobiology and high-level cognition. Instead what goes on in the neurobiology is cognition, though it is typically cognition that is far below our conscious access.

Even given the rhetorical purpose of gradually introducing their audience to the role neuroscience can play with respect to the embodiment hypothesis, some better simple theoretical frameworks than their three-leveled model exist. Steven Kosslyn, for example, has proposed the cognitive neurosciences triangle,[45] which illustrated in the Figure 8. In this model he attempts to capture the point that neurocomputational modeling is a

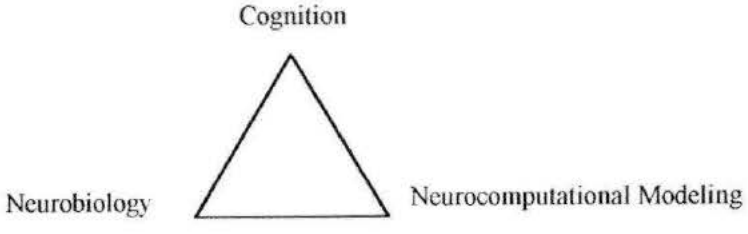

FIGURE 8. Stephen Kosslyn's Cognitive Neurosciences Triangle

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[45] Kosslyn, *Image and Brain*, p. 36.

methodology and not a level of investigation by placing neurocomputational modeling and neurobiology at the base of an equilateral triangle, converging together upon cognition at the top vertex of the triangle. As it relies on analogues to the neurobiology, he argues that neurocomputational modeling is best conceived as working alongside neurobiology. He argues that neurocomputational modeling best works as a methodology which models parallel one level of complexity in the neurophysiological organization, or at the most bridges small gulfs between some tightly coupled levels of neurophysiological organization. As such, it is a methodology which is germane to modeling processes at multiple levels of neurophysiological investigation, rather than constituting a level of investigation in itself.

The Embodiment Hypothesis: The Big Picture Framework

A fuller understanding of the embodiment hypothesis requires a much more detailed framework specifying many more multiple levels of investigation than either of the models given by Lakoff and Johnson or by Kosslyn, as neurocomputational modeling, though important, is still only a small fraction of the story about embodiment. Instead of the three-tiered (or five-tiered) framework of levels of investigation for the embodiment hypothesis that Lakoff and Johnson propose, I am going to propose a "Big Picture" framework of the multiple levels of investigation which ties together as many as possible of the various senses of embodiment which I surveyed at the beginning of this section.

The most basic organizing criterion of the "Big Picture" framework (see Figure 9)

Size	Physiological Structures	Level of Investigation	*Typical Conceptual Metaphor Theory Tasks*	*Sample Operative Theoretical Constructs*	*Sample Methods of Study*
1 m and up	Multiple Central Nervous Systems	Conceptual systems in culture, history, language, science, rhetoric, literature, and philosophy	Use of widespread cultural metaphors and novel poetic metaphors in interpersonal communication; historical and cross-cultural analyses of conceptual metaphors	Complex conceptual metaphor, conceptual blends, disanalogy	Linguistic analysis, textual analysis, discourse analysis, phenomenological philosophical analysis
.5 m to 2 m	Central Nervous Systems	Conceptual systems, cognitive systems, and linguistic systems as performed by individual subjects	Understanding metaphors (both conventional & unconventional), Extending metaphorical inference to novel cases, Facilitation of related information, inference generalizations	Complex conceptual metaphor, conceptual blends, disanalogy, primary or orientational metaphor, metaphor mappings, inference generalizations	Verbal report, observational neurology and psychiatry, discourse analysis, cognitive and developmental studies examining reaction time (RT)
10^{-1} m to 10^{-2} m	Gross to medium size neural regions (anterior cingulate, parietal lobe, etc.)	Neural systems	Activation course in somatosensory, auditory, and visual processing areas when processing conceptual metaphor or multimodal perceptual experiences	Conceptual metaphor mappings, primary metaphor, conceptual blends, disanalogy, image schemata, topographic maps	Lesion analysis, neuroimaging with FMRI, PET, sometimes in combination with ERP, neurocomputational simulations
10^{-2} m to 10^{-4} m	Neural networks, maps and pathways	Neural circuitry in maps, pathways, sheets	Neuroanatomical connections from visual, auditory, somatosensory region to language areas	Image schemata, primary metaphor, topographic maps, convergence zones	Electrocellular recording, anatomical dyes & other methods, neurocomputational simulations
10^{-3} m to 10^{-5} m	Neurons, Cortical columns	Cellular and very small intercellular structures	Neuroanatomy of particular structures recruited by image schemata and conceptual metaphor	Triangle cells	Electrocellular recording, anatomical dyes & other methods, neurocomputational simulations
less than 10^{-5} m	Neuro-transmitters, ion channels, synapses	Subcellular, molecular and electrophysical	None--beyond theoretical scope	Neurotransmitter	Neuro-pharmacology, neurochemistry, neurophysics

FIGURE 9. The Big Picture Framework for the Embodiment Hypothesis in Cognitive Science as Applied to Conceptual Metaphor Theory

is the scale of the relative physical sizes of the phenomena which produce the different kinds of cognitive or neural events to be studied. Size is mapped on the Y-axis, providing a relative distribution of the "higher to lower" levels of cognitive processes. A secondary organizing criterion comes next as I identify some of the most relevant physiological structures at a given physical scale. I then describe the "Level of Investigation" in accordance some with the kinds of cognitive processes studied at that order of magnitude.

Because I want to preserve Posner and Raichle's deep insight that it is profitable to consider how the experimental tasks change at various levels of investigation, the "Tasks" column of the "Big Picture" framework specifies for conceptual metaphor theory in particular some typical relevant tasks. Where the notion of an experimental task does not apply, I provide some other relevant foci of analysis. In the next column I describe some of the relevant theoretical constructs operative at the level of investigation, while in the final column I identify some of the various methods used to study phenomena at that level of investigation. Neurocomputational models play a role in some, but not all of these levels of investigation.

In this chapter's brief history of the embodiment hypothesis and in many places throughout earlier chapters, I have already set out many of the theoretical details of conceptual metaphors and image schemata. These theoretical constructs are well established at the top two levels of my framework--at this point in time, the conceptual metaphor hypothesis is "top-heavy" in that it is primarily focused on two cognitive systems levels. Oddly enough, the next best support is near the bottom levels of the framework, in the levels of neural circuitry and neurocellular structures. The perceptual

systems have small scale neural groups which depict information in topological maps which preserve the spatial, or the color, or the auditory contours of the object. For example, we have a topological map which would preserve the form of a shape presented to our eyes. While no exact matches between Johnson's specific proposals for image schemata and these maps have been found, the requisite topological substrate is there to be passed into such (or highly similar) schematic structures. The pace of success in mapping the visual system provides a promising outlook for determining the existence of such structures, at least within a single modality.

What is most pressingly needed are neuropsychological tasks[46] to test for the presence of image schemata in linguistic and non-linguistic contexts, so that investigation at the neural systems level can link areas known to have image schematic structure to language areas using neuroimaging and related techniques. Such studies proceed by examining the regions in which brain lesions lie that produce deficits of function. The ideal sorts of neuropsychological tasks are ones which doubly "dissociate" a behavior from a neural system--in other words, the behavior is present when system X is damaged and when system Y is intact, and it is not present when system X is intact and system Y is damaged. In order to be successful, such tasks must be highly specific and often test the conceptions of a higher level of investigation (such as conceptual metaphors) on a piecemeal basis. Once a task sufficiently establishes a dissociation, it can usually be

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[46] The right basis to begin this work is the existing literature on image schemata within experimental psychology. See Gibbs, *Poetics of Mind*.

adapted to the physical and temporal constraints of neuroimaging experiments. Some of the constraints on such experiments include (1) finite windows of time in which the activation can be measured; (2) the activation patterns must be relatively stable; (3) the task should be repeatable within the time window.

What kinds of deficits in neurological function might one expect to observe, if image schemata do in fact underlie the conceptual metaphors which make up much of our linguistic and conceptual systems? This is not an easy question to answer. A plausible start might go as follows. A long tradition of neurological research[47] on conceptual categorization has shown that patients have selective deficits for tools as opposed to persons or animals, and more recent neuroimaging studies suggest there may be an association between the embodied patterns of hand movements and the ability to recall words for hand tools.[48] Working along similar lines we might analogously extend this work to investigate conceptual metaphor. As Gibbs' reaction-time studies in psychology argue that conceptual metaphors facilitate related inferences, then it may be possible that such patients would show deficits in their ability to draw inferences based on conceptual metaphors where tool use or particular animals serve as part of the source domain. Presumably the facilitation effects which Gibbs' work observes in healthy patients would not be found.

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[47] This evidence was established primarily by C. K. Warrington starting in the late 1950s. For a cogent summary of this line of research, see Caramazza's "The Brain's Dictionary."

[48] Damasio, "A Neural Basis for Lexical Retrieval."

Similarly, investigating image schemata might show even more selective deficits, if some patients fail to respond to a facilitation cue for a particular kind of conceptual mapping. For example, the containment schema underlies numerous mappings in different conceptual metaphors, from deeply conventionalized mappings such as getting lost in the newspaper to highly inventive ones such as Plato's disanalogical metaphor drawing on the differences between taking food into the body and ideas into the mind. One could test a patient with a battery of metaphoric expressions which draw on the containment image schema, and develop other sets of metaphors which try to isolate the other image schemata. If the hypothesis bears out and selective deficits were observed along differing lines of image schematic structure, then lesion analysis using neuroimaging techniques might then show a localization of function for differing image schemata.

In the next section of this chapter I will shift from considering a framework for investigating conceptual metaphor to considering how conceptual metaphor operates a theoretical tool in the cognitive sciences. Before I go on to do that however, two caveats about my proposed framework are in order. First, while in this instance I have filled out the "Big Picture" framework specifically for conceptual metaphor theory, the framework should be seen as a general one for giving embodied explanations in cognitive science, not as one limited to this particular theory. One could as easily fill in the rightmost three columns--their heads in italics--with, for example, the tasks, theoretical constructs and methodologies used in studying mental imagery or categorization. Second, while the "Big Picture" framework has the advantage of not being bound by making a single dominant methodology responsible for linking cognition to neurobiology, its scope also means it has

the limitation of being unwieldy. This points to the fact that in order to make concrete advances in scientific research, it remains much more valuable to stick to one methodology during the course of research--as Bailey, Narayanan and the rest of the NTL group did in proposing their five-tiered framework. It is only when we are attempting to give a philosophy of cognitive science that we have the luxury of trying to explain human cognition using all the methodologies present and levels of investigation present in the "Big Picture."

Though obviously my focus in this section has been tracing the cognitive science roots of the my "Big Picture" framework, I should also credit Dewey's metaphysical picture here as contributing some often overlooked factors. First, and as I have already mentioned, the notion of independent levels of investigation draws specifically on the Deweyan rather than Aristotelian metaphysical picture of knowledge. By providing a pluralist metaphysic of knowledge, Dewey has laid the background for the ready acceptance of a levels of investigation framework in which the sciences are not hierarchically structured as ultimately reducible to a single master science. Second, Dewey's notion of the cultural situatedness of embodiment provided me with the inspiration for my top level of analysis, which investigates the products of humans interacting with each other--an often overlooked level in the rush to find the neural substrates of this or that cognitive behavior. By contributing this cultural level of embodiment, Dewey's metaphysical picture makes possible to place into this same framework the kind of analysis of the metaphors of cognitive science (where science is considered as a cultural phenomenon) that I do in the next chapter. Finally, although I am

not going to discuss the (complicated) details of these hypotheses in this chapter, both Gerald Edelman's selectionist theory of how an organism's brain develops and Terence Deacon's account of the co-evolution of language and culture owe much to Dewey's argument that Darwinian principles can be extended into giving an account of the embodied mind.[49] Dewey deserves credit for having the insight that models based on population thinking and differential selection can produce methodologies applicable to the study of cognition and mind at multiple levels of explanation.

Conceptual Metaphor in Cognitive Science

As I have pointed out, there are two basic ways in which the work on conceptual metaphor bears on the cognitive sciences. First, conceptual metaphors are a theoretical construct within cognitive science; they are entities which were originally proposed to account for a great deal of linguistic data. As I have described them thus far in this chapter, conceptual metaphors and other similar theoretical constructs have now been situated relative to a theoretical framework with a variety of different levels of investigation and methodologies.

But there is a second important relationship between conceptual metaphor theory and the cognitive sciences. I have been arguing throughout this dissertation that metaphors are constitutive of theoretical work in science and philosophy. This argument

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[49] See Edelman, *Bright Air* and Deacon, *Symbolic Species*. Deacon specifically acknowledges Dewey's philosophical contributions.

implies that it is also possible to analyze the conceptual metaphors which shape the hypotheses in the cognitive sciences. This kind of investigation is a project in the philosophy of science. As such, it is an investigation into a conceptual system and hence is located at the top levels of the framework I have proposed. It is not an attempt to bring various lower-level cognitive sciences to bear on the theoretical proposals about conceptual metaphor. This kind of attention to theory shows how conceptual metaphor analysis can be instrumental in shaping further hypotheses even for areas of study other than conceptual metaphors within cognitive science. As it is analyzing scientific theories as a cultural product, this project is one that takes place entirely within the top level of analysis in my "Big Picture" framework.

In this section I will be discussing only a small portion of a much larger project studying the conceptual metaphors of the cognitive neuroscience of attention undertaken by Diego Fernandez-Duque and Mark Johnson.[50] Fernandez-Duque and Johnson argue that the concept of attention is defined by multiple inconsistent conceptual metaphors. These metaphors guide scientists as they identify relevant phenomena, frame hypotheses, construct experiments and interpret data. While they survey a wide range of metaphors in tracing more than fifty years of the history of attentional research in psychology, I want to focus on what they call the Attention Is a Spotlight metaphor. I will be arguing two related themes with respect to their work: first, that their general approach accurately

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[50] Diego Fernandez-Duque and Mark Johnson "Attention Metaphors: How Metaphors Guide the Cognitive Psychology of Attention," *Cognitive Science*, forthcoming 1999.

captures the ways in which conceptual metaphors constitute theories of attention; and second, that by extending their work with my notion of disanalogical metaphoric inferences and Fauconnier and Turner's theory of counterfactual conceptual blends, we can better see how it is that conceptual metaphors drive specific research hypotheses.

The Attention Is a Spotlight metaphor is another step-child of the visual metaphor of Knowing Is Seeing (together with its mapping of ideas as objects) that I have analyzed in the second chapter of this dissertation. In those metaphors we conceptualize the contents of the mind as objects which can be known (or "viewed") by a rational ego which analyzes (or "illuminates") the contents of the mind by concentrating our powers of reason ("light") upon them. Similarly, the spotlight metaphor also takes its impetus from the entailments of that something which is better known is in better light. Presumably our rational ego, conceived as if it were some small homunculus in our head, consciously directs and focuses the spotlight of our reason onto the various objects of knowledge. The basic insight of the Attention Is a Spotlight metaphor is that we can concentrate (or "focus") the "attentional spotlight" onto a particular idea-object (or "mental representation") by attending to (or "looking more closely at") that object. Fernandez-Duque and Johnson give a conceptual mapping for the Attention Is a Spotlight metaphor as follows in Table 6.

Given this basic mapping, Fernandez-Duque and Johnson trace out a number of studies which attempt to determine whether the attentional system does actually behave like the source domain of a spotlight. They show that researchers take the properties of a

TABLE 6. The Attention Is Spotlight Metaphor

Spotlight (Source Domain)		Attention (Target Domain)
Spotlight	→	Mechanism of attention (attentional system)
Agent who controls the spotlight	→	Executive system
Agent who sees	→	Awareness system
Potential field of vision	→	Representational space
Area illuminated by the spotlight	→	Attended area

spotlight and expect to find corresponding properties for attention. For example, researchers have asked that, since a spotlight illuminates all of the properties--color, shape, etc.--of an object within the beam, would the attentional system attend to all kinds of properties as well?[51] Another set of studies asked whether, since a spotlight must always be moved from the last focused position to its new position, it would illuminate the intermediate areas as it passed through them.[52] A related study asked more specifically whether, as a spotlight must always be moved to its new target from the last place at which it was focused (rather than from some neutral "reset point"), the attentional system

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[51] George Sperling and Erich Weichselgartner "Episodic Theory of the Dynamics of Spatial Attention," *Psychological Review*, v.102, n. 3, 1995, pp. 503-532.

[52] See G. L. Shulman, R.W. Remington, and J. P. McLean "Moving Attention Through Visual Space" *Journal of Experimental Psychology: Human Perception and Performance*, v. 5, 1979, pp. 522-526 and Y. Tsal, "Movements of Attention Across the Visual Field," *Journal of Experimental Psychology: Human Perception and Performance*, v. 9, 1983, pp. 523-530.

always moves from that last focused point.[53] In all these cases and the many others examined by Fernandez-Duque and Johnson, researchers are clearly projecting inferential patterns from the source domain onto the target domain to provide them with their research hypotheses.

Whether or not the particular entailment suggested by the conceptual metaphor bears out analogously or disanalogously, however, is a matter of empirical investigation. The author of the last study I mention in the previous paragraph, Müsseler, is quite explicit about his desires to investigate an entailment of the Attention Is a Spotlight metaphor:

> One implication of the spotlight metaphor of visual-attention is that attention moves from position to position, from one object in the visual field to another.... If we use the spotlight in its literal sense, the metaphor suggests a specific spatiotemporal course of focusing: first of all, the assumption of a continuous movement through the visual field.[54]

Müsseler's idea was that the attentional system might reset to neutral position between attentional episodes. In other words, he hypothesized that after an attentional episode we might return to a state of diffuse attention in which we attend to a wide variety of objects, and then move the attentional spotlight from a more neutral position than the last focussed position. The attentional spotlight would then be "position independent" as opposed to the "position-dependent" spotlights of the source domain. His argument can be

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[53] Jochen Müsseler, "Position-dependent and Position-independent Attention Shifts: Evidence Against the Spotlight and Premotor Assumption of Visual Focussing," *Psychological Research*, 1994, v. 56, pp. 251-260.

[54] Müsseler, "Attention Shifts."

schematized as in the disanalogical metaphoric inference depicted in Figure 10.

Spotlight (Source Domain)	Attention (Target Domain)
1) Suppose the spotlight is focussed on a tree	1) Suppose attention is focused on a particular position in the visual field
2) Suppose we would like to focus on a dog	2) Ask the subject to move attention to a different location in the visual field
3) The spotlight would move across the field of vision from the tree to the dog	3) *Unlike a spotlight, attention does not always have to move from the last focused position to the new focus
4) The spotlight would not move from an unrelated default position	4) *Unlike a spotlight, the attentional focus can move from a position entirely unrelated to the last focused position whenever the attentional system is "reset"
Therefore, moving a spotlight is "position dependent"	*Therefore, switching attention might differ from moving a spotlight in that the attentional system is "position-independent"

FIGURE 10. Müsseler's Disanalogical Reasoning Using the Attention Is a Spotlight Metaphor

Müsseler's empirical results bore out his hypothesis, but they were controversial because they contradicted previous studies which showed that as the attentional spotlight moved, it illuminated intermediate areas within the attentional field. Müsseler proposed that further investigation might show that there were two manners in which attention could shift. First, if the object were sufficiently close to the last attended position, then the attentional spotlight would move in a position-dependent manner. Second, if the objects were further apart in the attentional field, then the attentional spotlight would move in a position-independent manner. Empirical research has yet to sort out whether the "nearness" criterion or another criterion will resolve this incongruity.

What is especially interesting about Müsseler's results from the perspective of conceptual metaphor theory is that they raise a question about how conceptual metaphor theory can account for cases where the projection from the source to target produces a disanalogous (or experimentally contraindicated) inference. The question raised is the familiar one of whether any use whatsoever of metaphor is misleading in doing science or whether this particular metaphor is misleading and should be replaced by others. This problem is similar in form to the one I raised in the second chapter of this dissertation concerning Socrates repeated use of disanalogies in philosophy.

On the one hand, one could maintain that such disanalogous results show that the use of metaphor to guide research on attention is mistaken and such research ought to be done entirely without metaphors. On this view, such disanalogies illustrate that we are really after knowledge about the target domain which is independent of metaphor. Or, on the other hand, one could argue that such disanalogies show that that attentional research should be guided by metaphors than the spotlight metaphor. Indeed, Müsseler's use of the term "reset" suggests that he may think the underlying neural systems may be "reset" just as a computer system can be reset. That would suggest a computer metaphor as opposed to a spotlight metaphor for the attentional system.

My proposal that metaphorical inferences can be disanalogical stems from the fact that neither of these options fit what actually happens in the bulk of scientific theorizing. Why should we suppose that the conceptual metaphor no longer organizes our knowledge about the target domain simply because a conceptual metaphor engenders negative results in the investigation of one of its entailments? Characterizing the attentional system as a

"position-independent" spotlight remains a metaphorical characterization, though it is a somewhat dissonant and unstable characterization which calls out for further analysis. But instead of revealing that metaphor is optional to or misleading in scientific theorizing, this instability illustrates that metaphorical mappings are not fixed but dynamic. This dynamic flexibility is especially true in the case of mappings not at the core of the mapping, but which are the result of inferential extensions. Fernandez-Duque and Johnson observe that the source domains of conceptual metaphors can be changed in ways which accommodate disanalogous results:

> The most frequent strategy to solve the tension between theory and data is to co-opt the conflicting data by making slight changes to the source domain. Such alterations of the metaphorical framing allow the incorporation of the data that was conflicting when the frame was narrowly conceived.[55]

Their point is that metaphoric mappings are flexible enough that experimental results that disanalogically block the projection of structures from the source domain provide source to target feedback, and this feedback can cause adjustments to the source domain, especially for the mappings of the less central elements in the metaphor.

In a moment I will discuss precisely how such feedback causes accommodations in the source domain, but first let me emphasize again that negative feedback does not normally lead to a change in the dominant theoretical metaphor. Of course the gradual accretion of many results disanalogous to the metaphor may eventually cause a more radical shift in the choice of what metaphor to use, but such wholesale shifts are rare. As

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[55] Fernandez-Duque and Johnson, "Attention Metaphors," p. 18.

Fernandez-Duque and Johnson conclude their discussion of this point:

Much less frequently, an entire metaphor is discarded and is replaced by a new one, but this requires such a drastic restructuring of the theoretical framework that this strategy is used only in exceedingly rare cases of radical theory change.

> In the majority of cases disanalogies result in an adaptation to the existing conceptual metaphor, while a wholesale change in metaphor more often signifies a move to a more successful (or a rival) theoretical camp who organize their data around a competing metaphor system.[56]

Distinguishing the Strong Directionality Constraint on Metaphoric Mapping from the Constraint on the Directionality of Explanation

Yet these adaptations to conceptual metaphor mappings appear fly in the face of one of the central tenets of the strong formulation of the embodiment hypothesis: the *directionality constraint on metaphoric mappings*. For example, in their article Fernandez-Duque and Johnson claim that "each submapping is directional, going from source to target." However, at the same time they acknowledge that the negative experimental results can force slight changes to the source domain. Source domain accommodation would not be possible without some kind of feedback from the target to the source.

I will be arguing that this feedback works in two basic ways. Much of the time, the feedback from a disanalogy takes the form of blockages or overrides, and operates as a selectional constraint on what source domain elements can suitably mapped across and at

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[56] Fernandez-Duque and Johnson, "Attention Metaphors," p. 18.

most causes slight alterations to the source domain structure (typically to the more inferential and peripheral portions of the mapping). In other instances the feedback effects from a disanalogy can cause widespread changes within the metaphoric mapping in which the organization of central elements in the source domain is reconfigured to suit the inferential needs of the target.

We can use the Müsseler disanalogy as an example of how a slight alteration might be made to the source domain, though the actual story will prove far more complicated (and therefore also far more interesting). In this example, we would say that Müsseler's experimental evidence about the target domain of attention "blocks" (or "overrides") the attempt to project the inferential entailment that ordinary spotlights are "position-dependent" because they must always be moved from their last position. Thus Müsseler characterizes the attentional system as a "position-independent" spotlight; that is, as a spotlight which does not quite behave like a normal spotlight. And it is fairly easy to see how the source domain could be changed just slightly to accommodate these results: it is as if the spotlight were turned off while it returns to a neutral position, and is then turned back on. The feedback from the blockage would then force only some slight changes to our understanding in the source domain in order to resolve the discrepancy.

However, the resolution of this disanalogy within psychology is complicated by previous experiments which show that the attentional spotlight illuminates intermediate areas in its path as the spotlight of attention shifts focus from one location to another. Though generally accepted as methodologically sound, Müsseler's findings were controversial because that previous research suggested that when the attentional spotlight

attends to intermediate areas as it is moves, the attentional spotlight is behaving in a manner that is "position-dependent." As I have already mentioned, Müsseler hypothesized that further research might indicate that there might be a sort of "nearness" criterion by which spatially proximate attentional shifts would not require a "reset" operation, whereas more distal attentional shifts would require this operation.

The result of such a controversy is that the theoretical discussion comes to be intensely focused on how the source domain might be reconfigured to keep the metaphor--and the theory--intact. And in fact at a conference where I presented the Müsseler research as an example of disanalogy, several participants quickly proposed adjustments to the source domain. For example, if one thinks of the spotlight in a theatrical context where the spotlight first illuminates an actor within one area of the stage, and then another actor within another area, there is no requirement that the (singular) "spotlight" be produced by a single mechanism, for theaters typically have a system of spotlights (plural).[57] A system of spotlights might then produce what would appear to be position-independence.

The case may well be the same with a system of attentional spotlights. For example, one hypothesis that makes good neurobiological sense is that it might be possible that a system of spotlights attends to different properties of perception (such as motion, form, and color which are known to be processed in spatially discrete areas of the visual

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[57] The suggestion that the attentional spotlight was more like a theatrical spotlight was made to me by several people, most memorably by Sarah Douglas.

system of the brain).[58] It might be possible then, that such the position-independence and position-dependence controversy will be resolved (at least in part) by investigating to how multiple attentional spotlights can attend to different properties of phenomena. If this hypothesis bore out, then Müsseler's results would be accommodated by a relatively permanent reconfiguration of the source domain of the metaphor.

Regardless of whether that particular hypothesis is in fact borne out by further experimental research, *in order even to formulate* the multiple spotlight hypothesis the feedback has already caused at least a temporary reconfiguration of the source domain.[59] This is an important point, because it illustrates how the discordant feedback effects of a disanalogy can prompt us to reverse the usual directionality of the metaphor mapping. By consciously reflecting on what might be a possible explanation for Müsseler's position-independent attentional system, we project the notion of the position-independent attentional spotlight backwards onto the source domain of ordinary spotlights. But the solution that emerges, thinking of the spotlight as a circle of light which illuminates first one and then another actor on the stage, requires that we reconfigure the source domain. First, the mechanism of a single spotlight has to be replaced by a *system of spotlights*.

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[58] The foundational study suggesting multiple spotlights based both on cognitive science and on neural architectures is Sperling and Weichselgartner's "Episodic Theory." For example, they write: "In terms of luminance analogies, the quantal theory would be modeled by a *system of spotlights* ... In a model of a shift of attention, the initial position of attention is represented by *one spotlight that turns off* while *another spotlight*, representing the final position, is *turned on*" (p. 503).

[59] In fact, this suggestion will probably not pan out in this case given the exact details of Müsseler's experiment. But once again what *is* interesting is that a change in the source domain takes place, as evidenced by the previous quotation from Sperling's "Episodic Theory" article.

That poses new questions when the change in the source domain is subsequently projected again onto the target domain, and this generates the research hypothesis about how one might test for such a system of spotlights as an explanation of position independence.

The question naturally arises as to whether or not such this more dramatic sort of disanalogous feedback contradicts the strong formulation of the embodiment hypothesis as including a constraint on the directionality of metaphoric mappings. I would propose that here we must be careful to distinguish between two aspects of the embodiment hypothesis. On one hand, we have a generalization about the regularities about the directionality of mappings within a particular metaphor system, as when Fernandez-Duque and Johnson write that each submapping is directional. On the other hand, we have a regularity about which source domains recur as bases for metaphorical projection. I suggest that this second sense be called the *directionality of explanation* to distinguish it from the directionality of individual metaphor mappings.

Given this distinction, the feedback effects from disanalogies fall into two broad classes: first, those cases where the feedback from the target simply blocks what can be projected (target domain overrides); and secondly, those cases where the feedback from the target requires reconfiguring the source domain around the inferential structure of the target, parts of whose structure is consciously projected back onto the source as we search for an explanation. However, it is important to also point out that even in this more extreme second case, at no time in this feedback loop do we ever attempt to explain spotlights in terms of attentional processes. In other words we preserve the directionality of explanation, even though we do not always preserve the directionality of the

metaphoric mapping.

These two aspects of the embodiment hypothesis can often be conflated, but they are situated at slightly different levels of investigation. Feedback effects which reconfigure the source domain do contradict the strong directionality constraint on metaphor mappings, though those exceptions should be relatively unsurprising as metaphor mappings are not supposed to be fixed but dynamic. However, it does not violate that aspect of the embodiment hypothesis which operates as a constraint on the directionality of explanation. We still do not see the details of attention systematically used as a source domain to understand the inner workings of spotlights. That is, we still understand the complex in terms of the simpler. Further, distinguishing between these two aspects of the embodiment hypothesis reveals a difference in their scope. The directionality of explanation applies to what kinds of domains are typically used as source domains by conceptual metaphors, not to the mapping and the various submappings of a particular conceptual metaphor.

The Two Kinds of Directionality in an Example from Chinese Philosophy

As a further example of what I mean by the directionality of explanation, it may help to consider a passage on the nature of explanation from Chinese philosophy. Lau translates the key Chinese term "analogy," but I would argue that the point applies just as well to conceptual metaphor. (Remember that I have previously argued that the conceptual metaphor hypothesis overturns the traditional distinction between metaphor as

literary and analogy as cognitive, and instead understands conceptual metaphor as a cognitive operation which encompasses a system of analogies and disanalogies.) The passage follows:

> Someone said to the King of Liang, "Hui Tzu is very good at using analogies when putting forth his views. If your majesty could stop him from using analogies he will be at a loss what to say."
>
> The King said, "Very well. I will do that."
>
> The following day when he received Hui Tzu the King said to him, "If you have anything to say, I wish you would say it plainly and not resort to analogies."
>
> Hui Tzu said, "Suppose there is a man here who does not know what a *tan* is, and you say to him, 'A *tan* is like a *tan*,' would he understand?"
>
> The King said, "No."
>
> "Then suppose you were to say to him, 'A *tan* is like a bow, but has a strip of bamboo in place of the string,' would he understand?"
>
> The King said, "Yes. He would."
>
> Hui Tzu said, "A man who explains necessarily makes intelligible that which is not known by comparing it with that which is known. Now Your Majesty says, 'Do not use analogies.' That would make the task impossible."[60]

This marvelous parable makes three important points which sum up with great precision many of my arguments. First, I take the overall point of the parable to be that it is impossible to give explanations without using something like what Lau translates as analogy and I would call conceptual metaphor. Metaphors and analogies are intrinsic parts of explanation and theorizing; they are not merely optional rhetoric adornments. This insight that metaphors are constitutive of theorizing is one of the central arguments (especially of the first half) of my dissertation.

Second, Mencius' parable shows that the points of analogy are not always straightforwardly projected in a unidirectional manner, but also includes a point of

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[60] *Mencius*, trans. by D. C. Lau (London: Penguin, 1970), pp. 262-263.

disanalogy where the target gives feedback to the source: "a tan is like a bow, but has a strip of bamboo in the place of the string." In my terms I would say that although there is a predisposition to directionality in mapping of a conceptual metaphor, this predisposition may be blocked (or overridden) by a point of disanalogy: the "strip of bamboo in place of the string." This feedback would then require conscious attention to the feedback between the source and target in order to limit what is mapped over from source to target as we construct an integrated image of what a *tan* is. This feedback is an example of what I have called blockage in disanalogical inferences, as opposed to the more dramatic case of source domain reconfiguration in the case of the attentional spotlight.

Third, and most importantly of all for the current point, the parable shows that in order to count as explanations of the unknown, conceptual metaphors must necessarily draw upon that which is known. The nature of explanation requires that there be a directionality from known to unknown in a conceptual metaphor; otherwise the so-called explanations are so useless as to call into question whether they are explanations at all. This insight underlies why I have been arguing for a distinction between the directionality of metaphor mappings and the directionality of explanation, as the directionality of explanation is broader in scope than the directionality of metaphor mappings.

Directionality, Conceptual Blending and the Embodiment Hypothesis

Finally, to understand why the distinction I am drawing between the strong directionality constraint and the embodiment hypothesis is so important, it may also be

helpful to consider a similar challenge to the directionality of metaphor mappings from an offshoot of conceptual metaphor theory known as conceptual blending (or conceptual integration).[61] A parallel phenomena to what I have called disanalogical inferences was one of the motivating factors for the theory of conceptual blending. Gilles Fauconnier had a number of examples of what he called analogical counterfactuals, such as "If Watergate had happened in France, Nixon would never have been impeached." It is of course impossible--contrary to fact--for Watergate to have happened in France, and for Nixon to have been President in France. Yet despite the counterfactual qualities of the analogy, we can reason about what happens to presidents who break their country's laws on the basis of an analogy between United States and France in 1972. However, the inferential structure of the source--Nixon's actions causing his impeachment--does not successfully project onto the target. As with Socratic disanalogies, this is taken to reveal important ways in which France differs from the United States.

Together with Mark Turner, who had a number of examples of from literature that also challenged the directionality of the mapping, Fauconnier argued that such analogical counterfactuals in general could not be straightforward metaphoric projections of the inferential patterns of the source domain onto the target domain. Instead Fauconnier proposed that these analogical counterfactuals set up a "new mental space," which is a less constrained conceptual space than Lakoff and Johnson's "conceptual domains." This new

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[61] Gilles Fauconnier and Mark Turner, "Conceptual Integration and Formal Expression," *Metaphor and Symbolic Activity*, v. 10, n. 3, 1995, pp. 183-204.

mental space has emergent structure and properties not present in either the source or the target.[62] Fauconnier and Turner call this new mental space and its emergent structure a conceptual blend. For example, in the Watergate in France blend we set up a mental space which draws the event structure of the Watergate from a mental space containing the Watergate scandal as it happened in the United States, but the cultural norms and legal restrictions about the use and abuse of political power are drawn from second a mental space concerning France. Additionally we take Nixon from one space, and map him into the blend in his role as leader of the United States as the President of France. The blend has emergent structure of its own, namely the conclusion that a Watergate-like event structure combined with French political norms does not lead to a French Nixon's impeachment.

Both my disanalogical metaphoric inferences and Fauconnier's analogical counterfactuals require that we keep in mind both how the two original domains are alike and how they differ. Many thought experiments in science, including the notion of the attentional spotlight, are constructed to provide scientifically interesting intuitions in a counterfactual space that is only partially analogous to the original source domain. Just as Watergate could not have happened in France, the attentional spotlight is clearly not an ordinary, run of the mill, garden-variety spotlight. The attentional spotlight has emergent

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[62] For the sake of continuity with the terminology I have been using throughout this chapter, I continue to use the terms source and target in this brief discussion of conceptual blending theory. However, I should note that in Fauconnier and Turner's terminology these are no longer sources and targets but instead both are "input spaces" to the blended space.

properties and behaviors, such as "position-independence," that runs counter to the facts about ordinary spotlights.

In the theory of conceptual blending, what Fernandez-Duque and Johnson call "source domain accommodation" is a kind of "backwards projection" of the emergent structure of the blend back onto its source. In other words, we make the source look more like the target *after* determining the emergent properties of the blend. This is precisely why many creative theoretical debates in science seem to turn on ideas which are more germane to the source domain than the matter at hand, as in the suggestion that the attentional spotlight may operate more like a bank of theater spotlights than a single unitary spotlight. The real story, however, is that the kind of conscious articulation given to developing conceptual metaphors by scientists as they theorize makes extraordinary demands upon our usual manner of conceptualization.

For my own part, I believe that the central claim of conceptual metaphor theory is correct and conceptual metaphors are operations of the cognitive unconscious which shape large portions of our ordinary cognition. Further, I have argued that they normally shape cognition in the ways predicted by the embodiment hypothesis understood as the strong directionality constraint on metaphoric mappings. That is, I believe that most of the time we project, in a rather unidirectional fashion, knowledge from the source domains onto the target domain. However, I also think that in our extraordinary cognition, as when we consciously have to make disanalogous metaphoric inferences, we can inhibit the strong directionality constraint on metaphoric mapping.

Additionally, I think that Fauconnier and Turner's increased attention to this kind of conscious, temporally situated or "on-line" character to metaphoric thought processes may prove to be a very apt description of how these processes occur in real time within the brain. Though the supporting research has not yet been done, I would be willing to speculate that the difference between the blending and metaphor mappings might be made testable along the following lines. Cognitive psychologists have long had experimental evidence for a distinction between working memory and long term memory.[63] It may well prove to be that conceptual blending is a better account of how metaphoric extensions occur dynamically in working memory, and then are sometimes sedimented into conceptual metaphor mappings in long-term memory. At present this proposal is only a speculative hypothesis, however, and it remains no more than a suggestion for future research.

Conclusion: Patient-centered vs. Agent-centered Theories of Knowing

In this chapter I have argued a number of important related themes. First, I have set out the embodiment hypothesis in detail. Second, I have criticized the current framework for work on conceptual metaphor and the embodiment hypothesis within the cognitive sciences and argued that we should redirect the focus of such research from computational models back to embodied systems. Third, I have presented an analysis

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[63] See Barsalou, *Cognitive Psychology* for an overview of such evidence. Teenie Matlock of the Psychology Department at the University of California at Santa Cruz and I are currently collaborating on developing an experimental paradigm based on this idea.

which shows not only how conceptual metaphors are constitutive of scientific research, but how disanalogous metaphoric inferences are a crucial part of that metaphoric constitution. Most importantly however, I have proposed a theoretical framework in which the embodiment hypothesis is about tracing the body's active roles in shaping cognition through multiple levels of investigation.

What I have not yet done is explain what the role of philosophy will be in this project. Despite Plato's misleading use of the metaphor of the philosopher as physician in the quote with which I began this chapter, I could not agree more with his statement that "something like this is what I want for our present inquiry." I want philosophers to model themselves again on the physicians. But instead of seeking knowledge which is supposedly independent from the body, I want philosophical inquiry to seek knowledge which is responsive to the body. In the traditional disembodied account of knowledge, knowledge is supposed to be independent of pragmatic needs and the bodily situations out of which it arises. The classical account of knowledge enjoins the knower to seek to occupy the extraordinary standpoint of the universal knower, and--even as it seeks to minimize the importance of the particularities of the knower--it ironically calls attention to the knower precisely because those extraordinary demands are so impossible. In short, in situating the knower at the all-knowing perspective too much attention is given to the agent of knowing and not enough to the physician's--or the philosopher's--patient.

By contrast, philosophy well done can be a kind of therapy of the body. At the bottom of the various cognitive sciences with their neuroimaging apparati, their experimental methodologies and their stochastic calculations there lies a patient, often

with severe--and tragic--neural damage from a traumatic accident, a stroke, or an inherited syndrome. Theoretical science and philosophy done in consultation with the physicians can ameliorate this kind of suffering. Just as the physicians (and those philosophers of cognitive science who choose to work with them) might provide insights which lead to curing the not only the body but also the split between the body and the mind, philosophers who listen both to the physicians and to the body might be able to heal the contemporary fractures between the humanities and the sciences. It is these patients that I would rather see philosophy--and doctors of philosophy--make the center of concern.

In the final and concluding chapter of this dissertation, then, I will discuss the implications of the shift to the embodied mind for philosophy in general. In particular, I will argue that there are several insights in the feminist philosophy of science which can help to develop the philosophical side of the science I have discussed in this chapter. To refer again to the quotations from Plato with which I began this chapter, Socrates tells us not only that he is the midwife of souls and not bodies, but that he is midwife of men and not women. Feminist philosophy has been concerned with bringing the body back into philosophical discourse and has been at the forefront of re-imagining the histories of philosophy and science by paying careful attention to metaphor and rhetoric. Doing embodied philosophy well will incorporate not only insights from the physicians but also from the feminist philosophy of science.

CHAPTER VI

WHITHER PHILOSOPHY? ATTENDING TO RHETORICAL FORM AND METAPHOR

> You see how I wrote the conversation--not in narrative form, as I heard it from Socrates, but as a dialogue between him and the other persons he told me had taken part… I wanted to avoid in the written account the tiresome effect of bits of narrative interrupting the dialogue such as "and I said" or "and I remarked" wherever Socrates was speaking of himself, and "he assented" or "he did not agree," where he reported the answer. So I left out everything of that sort, and wrote it as a direct conversation between the actual speakers.[1]

I began this dissertation with three chapters explaining how philosophy came to acquire both a certain suspicion of metaphor and a certain negative attitude toward the body. As Plato's Socrates distinguished philosophy from rhetoric, philosophy was to eschew metaphors in favor of thinking about the things themselves. Socrates' reason was that metaphor, in the straightforward sense of projecting reasoning from one domain to a second domain, can sometimes mislead us. The key tool that Socrates used to distinguish philosophical argument from rhetorical argument was pointing out where the domains in a proposed metaphor differed from one another; that is, the places where the metaphor was

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[1] Plato *Theaeteus* 143b3-c4.

misleading. This Socratic process of noticing key differences is precisely what I have termed in chapter two *disanalogical metaphoric reasoning*, where my objective was to demonstrate its continuity with accounts of more straightforward metaphoric projections of reasoning. But for Socrates and the classical theorists generally, these points of dissimilarity between the domains were taken to reveal that philosophy was properly concerned only with knowledge of the causal and logical properties of a single domain--the thing itself. When this conception of inquiry reaches its fullest expression in Aristotle's attempts to set up a normative standard for philosophical and scientific inquiry, Aristotle enjoins science and philosophy to speak only in an unambiguous expository rhetorical form. This rhetorical form is supposed to be purely referential and ideally utterly devoid of ambiguous figures of speech such as metaphors. According to this account a philosophical metaphor can at best only be regarded with suspicion, because a metaphor is so potentially misleading.

The problem with the body is that it was also supposed to be similarly misleading. Whenever Protagoras or any other philosopher offers up the theory that knowledge is dependent on human perception and is therefore relative to the particular embodied standpoints from which humans experience phenomena, Socrates attacks the Knowing Is Seeing metaphor with disanalogical reasoning. The key disanalogy here is a difference between seeing and knowing. It is a fact about our ordinary experience of visual perception that, in the perspective we have from a particular embodied standpoint, larger but more distant objects can appear to be lesser in size than smaller but nearer objects. We regularly experience this whenever smaller objects occlude larger objects, as when a

building obscures our view of a mountain. At first blush it looks as though Socrates wants to say that the case is much the same with our reasoning--given certain particular perspectives our initial judgment about what we think we know is oftentimes mistaken. That much is straightforward metaphoric projection: just as ordinary seeing is flawed, so is ordinary judgment.

But the disanalogy comes when Socrates reconceives knowledge as the result of a kind of "perfected" seeing. Seeing must be "perfected" because while bodily sight can be deceiving (as in the example of relative vs. measured size), Socrates argues that the term "knowing" properly implies not being deceived. Consider his proposal as a kind of thought experiment about determining the relative sizes of objects: It is as if "knowing" properly is seeing things after they have both already been measured to determine their sizes and then re-presented again to our eyes already sorted in an order of increasing size. This extraordinary philosophical seeing then requires attaining a "perfect" perspective that would always yield knowledge of the sizes of things as they already are and hence would never make mistakes in judgment about their sizes. It would be seeing from an idealized universal standpoint, a standpoint that would keep every piece of knowledge in perfect proportion to every other piece.

Of course no such standpoint actually exists in the realm of ordinary sight, nor--if one did--could it ever possibly be inhabited by any human body. That is why the thought experiment is disanalogous. One of the standard philosophical characterizations of this idealized standpoint is as a view from above. Imagine that you are sitting in a park in a city that you know to be surrounded by high mountains, but the buildings are more

proximate to you, so they appear to be larger than the mountains. Now imagine that your body is slowly lifting off the earth and gradually looking around and back down at it from an ever-increasing height. At the right vantage point on this mythical ascent you would be able to determine that the mountains are larger than the buildings. But the idealized standpoint of all knowledge must look at things from many more vantages than just this one which happens to rectify this particular set of relative size problems. This idealized standpoint must also be able to resolve all the possible relative size deceptions. Hence, the philosophic eye has to look at everything from *everywhere* all at once. By definition then, this extraordinary looking also implies that the philosophic eye *cannot be located in a single place* at any given instant--or else it would still be subject to experiencing relative size distortions. Thus, and as Thomas Nagel has put it, the view from above is simultaneously both a view from *everywhere* and a view from *nowhere*.[2]

As I also pointed out in my second and third chapters, this idealized perspective is timeless as well as placeless. Socrates' proposal concerned not merely resolving the relative size problem with respect to present objects (of sight or of knowledge), but specifically proposed as a method that could compare future experiences with more immediate ones by using a Time Is Space metaphor. Remember that the size of an object was to be mapped to the amount of pleasure or pain it would bring, and the nearness or the distance from which the observer is from the object was to be mapped its relative

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[2] Thomas Nagel, *Mortal Questions* (New York: Cambridge University Press, 1979), pp. 196-213. Nagel discusses this double point starting page 209.

immediacy in time or its being in the future. If we pause to think about it, Socrates' metaphysical proposal really requires a number of implausibilities concerning time: We would have to be able to accurately measure the size of physical objects not present at hand, accurately measure objects of knowledge which are in the future, and accurately measure the amount of pleasure or pain a future action would bring. (With such extraordinary foresight into the future, there is no doubt we could also make a fortune in the stock market.) This idealized perspective is as timeless as it is placeless, and so the classical theorists argue that the objects of knowledge are eternal and unchanging.

But as human creatures are bound by the limitations of the body's location in space and time as well as by the limitations of the body's perceptual faculties, a human being's particular embodied standpoint cannot possibly yield perfect perspective. Yet when this conception of philosophical and scientific inquiry reaches its fullest expression in Aristotle, Aristotle enjoins us to engage in precisely this kind of thought experiment. In the thought experiment we are to think of things not as they appear to us from our own standpoint but as they (supposedly) actually are from the standpoint of all being. If we can only shift our standpoint to that nowhere place, then we will supposedly have philosophical and scientific knowledge that is genuinely independent of our own particular knowing standpoint. This knowledge is also supposed to be independent of our own particular embodiment because any knowing agent who can also make that shift from their own particular standpoint will also be able to follow the inquiry.

On this account, the correct rhetorical form for philosophical and scientific exposition would then take the general form of "*A*-knows that-*O*," where *A* is any

knowing agent and *O* is any object of knowledge.[3] The disanalogy between mental knowing and bodily seeing that provides the impetus for the move to a universal, idealized Aristotelian standpoint also requires that the body be left behind. Science and philosophy are to be done by minds that have assumed the disembodied perspective. Thus according to this account the philosophical consideration given to embodiment is supposed to be negligible, because the facts about our embodiment supposedly will almost always mislead anyone who seeks universal knowledge.

For traditional philosophical and scientific argumentation then, both metaphor and embodiment are supposed to be misleading. Though some other contemporary philosophical projects often take up the question of why one or the other has been downplayed, they do not systematically explain why both metaphor and embodiment are considered to be misleading, and why the reasons for having suspicions about both are supposed to hang together. Usually either a return to metaphor and a loosening of argumentative form or a call to rediscovering and re-imagining the body is championed as a solution, but without an adequate theoretical framework to situate the historical, cultural and scientific bases of why and how the two problems are systematically interrelated.

What is needed instead is the kind of account I have been providing. To recap: First, in a conceptual metaphor we systematically take the patterns of reasoning implicit in one domain and project them to a second. Obviously such projection does not always work without some modification of those source domain patterns, and the tradition has

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[3] Lorraine Code, *What Can She Know?* (Ithaca, New York: Cornell University Press, 1991).

seized upon this fact to argue that metaphors can be misleading. Thus to use metaphor in argument has been considered to be 'bad form,' that is, the using language in a way which is not exclusively expository. Providing an analysis of disanalogous metaphoric reasoning is crucial to an adequate explanation of the tradition's mistake here. Second, what the empirical and cross-cultural research on metaphor has shown is that conceptual metaphors draw on a relatively small number source domains that have to do with perception, movement, and other bodily activities. Thus in rejecting metaphor as misleading, the traditional view also systematically rejects the body as misleading because it is so pervasive as the source of the reasoning patterns projected by metaphors.

The example of the Knowing Is Seeing metaphor, together with its mapping of ideas as objects, is perhaps the paradigmatic example of the traditional view's unsuccessful attempt to cordon off philosophy by distinguishing first philosophic 'seeing' or reasoning from its metaphoric source in bodily seeing and secondly philosophical reasoning from metaphoric reasoning in general. The disanalogous entailments of the metaphor are reified into the structure what philosophical reason is supposed to be "in itself." This alternative account, which explains how the traditional rejection of metaphor and embodiment hang together, shows how philosophical inquiry uses the same embodied patterns of reasoning that humans do elsewhere.

The suspicion toward both metaphors and embodiment on the part of philosophers is profoundly mistaken. I have already argued for that claim, but in this concluding chapter I want to revisit this topic in terms of the question about what is to be the proper rhetorical form for philosophical and scientific inquiry. In particular, I want to examine

the rhetorical form of what I regard as successful projects within cognitive science and philosophy. I will begin with a discussion of the rhetorical form employed in Antonio Damasio's *Descartes' Error*. I am particularly interested in his use of the neurological case study method of analysis as an example of patient-centered philosophical analysis. His work is only one of a number of recent books in what might be called a new genre of literary cognitive neuroscience. In particular, Oliver Sacks has been able to popularize neurological case studies as entertaining literary anecdotes, though his books lack the sustained philosophical inquiry into an overarching question that characterizes Damasio's book.[4]

Next, I will suggest that as feminist philosophers have been experimenting with reshaping the rhetorical form of science and philosophy in their work, they have produced some interesting ideas for how this project of co-opting the rhetorical form into the substance of the argument might be successfully accomplished. As my example of what their work might contribute to an embodied philosophy, I will discuss an article by Linda Holler which offers an illustration of how rhetorical and argumentative form can be intertwined. In particular, her work is an example of how shifting the voice of a text may be used to mirror the philosophical shift from the disembodied tradition of knowing to an embodied one. Her article is a deliberate and conscious exploration of how the traditional metaphors for knowing might be reworked in ways which are consonant with an embodied

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[4] See for example Oliver Sacks' *The Man Who Mistook his Wife for a Hat* (London: Duckworth, 1985) and *An Anthropologist from Mars: Seven Paradoxical Tales* (New York,: Knopf, 1995).

philosophy of science, as well as augmented by new metaphors. Finally, I will conclude by arguing that her conception of laterally transcendent connections between different kinds of knowledge provides further guidance as to how and why the patient in the case-study method provides such a powerful point of convergence for the strange tale of mind, body and brain now emerging in the cognitive sciences.

Rhetorical Form and a Patient-Centered Philosophy of Cognitive Science

As I closed the previous chapter of the dissertation I suggested that, as a cure for the disembodied tradition of philosophy, philosophers should keep in mind the figure of the physician's suffering patient. Though I have outlined a complex project involving multiple levels of investigation, keeping the pragmatic focus on the patient's body allows an embodied philosophy to avoid the traditional metaphysical trap of seeking knowledge for its own sake. The focus on the suffering body can keep from philosophers from compounding past mistakes into further absurdities as they seek to construct theories of mind and language. I am not arguing that philosophy should leave the task of explaining mind and language to the neuroscientists, the linguists, or the scientific community generally. Instead an embodied philosophy should continue to take center stage in shaping theories about mind, language and cognition in ways that genuinely reflect real human concerns. But a genuinely embodied philosophy must also play its role in a way that takes into account the evidence from its supporting cast in the human sciences.

In many respects philosophers and neurologists have a strange kinship that might

be turned to their mutual advantage. At an interdisciplinary conference a psychologist friend once began his presentation with the following as a joke, but as with much humor it turns on a kernel of insight. Apologizing for the technical difficulties he was having in using his laptop computer to project images onto a screen, he said: "This is what I get for improving on the old paradigm that psychologists talk through their experiments using the overhead transparencies they have just made, linguists give handouts with the piles of examples they have collected, while philosophers just read their papers." The joke is supposed to be that philosophers don't have any data to discuss, but that usually isn't quite true. However, the kernel of insight here is that while linguists do have a methodological bias to present sentence after sentence of examples, the philosophers' concern with argumentation gives them a methodological bias toward papers where only one or two examples are discussed in detail. Like the philosophers, the neurologists (though they use many different methods) use a method that also follows a single patient through in detail--the case study method. The case study method enables a theorist to bring the multiple levels of investigation in the cognitive sciences to bear on a single afflicted body in a way that centers the debate on a human scale, not on the theoretical constructs of the sciences.

This is important for philosophers because, rhetorically speaking, human beings respond best not to talk of neurons and brain states but to stories which take place on a human scale. That is why one of the most successful recent books in philosophical cognitive science, Damasio's *Descartes' Error*, begins with a pair of case studies. In the first two chapters Damasio recounts the story of Phineas Gage. In 1848 Phineas Gage

was a railroad construction foreman who, while tamping explosives into a hole bored into a rock outcrop, accidentally detonated the explosive material. The iron rod he had been using as a tamping rod passed entirely through his head, entering his left cheek, traversing the front of his brain, and exiting at the top of his head. Though Gage heals well, his subsequent life is marked by a strange change in his character. Though his capabilities to perform calculations and use language were generally intact, he was now unable to make decisions in ways that would indicate a normal awareness of the social consequences of his actions. Gage developed a personality disorder so severe that he was never again able to hold a regular job. In the terms of phrenology--the brain science of his day--Gage's iron rod had traveled through the regions of his brain responsible for veneration and benevolence. By measuring Phineas Gage's skull with more modern techniques the regions of his brain lesions can be reconstructed as including the left ventromedial frontal cortex--a region whose anatomical function was until recently not understood much better than in Gage's time.

Opening with a focus on a case like Phineas Gage allows Damasio to use certain rhetorical strategies that would be precluded if he had followed a purely Aristotelian form of exposition on the topic of brain and mind. Not only do the vivid details of a tragedy that ravages a human being work to command our attention and sympathy, but beginning with a historical case enables Damasio to foreground the tentative nature of brain science. He can acknowledge both the errors and contributions of the nineteenth century phrenologists who believed that the brain had localized regions responsible for faculties like veneration and benevolence. Localization of function within the brain has generally

been a fruitful hypothesis in neuroscience, but both the functions accorded those localized regions and the methods of determining the natures of those functions have undergone drastic change. Some phrenologists, for example, argued for the wild hypothesis that one could measure the strength of various regions of the brain based on the size of bumps on the exterior of the skull. From his preface onward Damasio is quite explicit that parts of today's provisional hypotheses will undoubtedly seem just as wild as past hypotheses:

> At the outset I made my view clear on the limits of science: I am skeptical of science's presumption of objectivity and definitiveness. I also have a difficult time seeing scientific results, especially in neurobiology, as anything but provisional approximations, to be enjoyed for a while and discarded as soon as better accounts become available. But skepticism about the current reach of science, especially as it concerns the mind, does not imply diminished enthusiasm for the attempt to improve provisional approximations.[5]

The historical strategy, in combination with the case study method, allows Damasio to present a picture of brain science whose claims are neither objective nor definitive, but provisional and contingent. The metaphysical status accorded the kind of knowledge science produces is limited by the embodied historical standpoint from which it is produced--entirely compatible with what I have called in chapter four the Deweyan metaphysic of "as." Here Damasio uses the narrative rhetorical form of the case study method in a way that coheres with one of the substantive claims of his book: the products of reason, including science, are not independent of their embodiment.

Gage's case study is particularly dramatic, but what first convinced Damasio of the

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[5] Antonio Damasio, *Descartes' Error: Emotion Reason and the Human Brain* (New York: Basic Books, 1995), p. xviii.

main substantive claim of his book--that bodily feelings and emotions play a crucial role in human reason--was not a historical case study but the living, breathing patient whom he treats. Yet even when faced with the patient he first had to overcome the common philosophical predisposition to think that emotions and reasons are entirely split apart. He writes:

> I had been advised early in life that sound decisions came from a cool head, that emotions and reason did not mix any more than oil and water. I had grown up accustomed to thinking that the mechanisms of reason existed in a separate province of the mind, where emotion should not be allowed to intrude, and when I thought of the brain behind that mind, I envisioned separate neural systems for reason and emotion....
>
> But now I had before my eyes the coolest, least emotional, intelligent human being one might imagine, and yet his practical reason was so impaired that it produced, in the wanderings of daily life, a succession of mistakes, a perpetual violation of what would be considered socially appropriate and personally advantageous. He had had an entirely healthy mind until a neurological disease ravaged a specific sector of his brain and, from one day to the next, caused this profound defect in decision making. The instruments of rationality usually considered necessary and sufficient for rational behavior were intact in him. He had the requisite knowledge, attention, and memory; his language was flawless; he could perform calculations; he could tackle the logic of an abstract problem. There was only one significant accompaniment to his decision-making failure: a marked alteration of the ability to experience feelings. [6]

In the third chapter Damasio introduces his contemporary patient, who is called by the psuedonym Eliot. Like Gage, Eliot had been a highly successful professional before his left ventromedial frontal cortex was injured and had to be partially removed. But in Eliot's case the neurological cause of his difficulties was not an iron rod, but a large *meningioma*--a tumor which was removed from just inside his forehead. After the onset

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[6] Damasio, *Descartes' Error*, pp. xi-xii.

of the tumor, and continuing after its removal, Eliot's formerly sound personal and business judgment deserted him.

Where the historical strategy had allowed Damasio the opportunity to contrast on a historical basis the methods of phrenologists with contemporary methods of imaging the brain in three dimensions, focusing on a case study of a current patient allows Damasio opportunities to discuss how many various contemporary neurosciences provide multiple perspectives on the role of Eliot's brain-damaged areas. He accomplishes this feat through a number of long passages called "asides" which treat the basics of neuroscience in short summaries or miniature lectures. He is quite explicit about his rhetorical strategy of speaking in different voices at different times throughout his book:

> I wrote this book as my side of a conversation with a curious, intelligent, and wise imaginary friend, who knew little about neuroscience but much about life. We made a deal: the conversation was to have mutual benefits. My friend was to learn about the brain and about those mysterious things mental, and I was to gain insights as I struggled to explain my idea of what body, brain and mind are about. We agreed not to turn the conversation into a boring lecture, not to disagree violently, and not to try to cover too much.... It was also understood that, as befits a conversation, there would be byways and diversions, as well as passages that would not be clear the first time around and might benefit from a second visit.[7]

Damasio uses the commonplace form of a conversation to animate the knowledge coming from different neurosciences. The byways and diversions of the conversation which constitute the book's "asides" allow him to speak at times in a more historical or a more expository voice as he lays out background information on techniques used and new developments in neuroimaging, neuroanatomy, psychological testing, etc. In these asides

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[7] Damasio, p. xviii.

he presents information from which he draws specific insights about Eliot's and Gage's condition. By design, these byways in the conversation are not unlike what happens in the kinds of conversations which occur as physicians of different specialties consult with each other over a patient's course of treatment. The case study method continues to frame the main conversation, and the sciences are marshaled in terms of their pragmatic relevance to the particular case study.

I have described three key ways in which Damasio's use of rhetoric supports his substantive argument. First, he uses the case study method to take up problems on a human scale, the scale that has the most meaning for us, and then uses that method to explore the ways in which the various cognitive sciences contribute to our understanding of that patient. Rather than conceiving scientific knowledge as an end-in-itself, the focus on the patient correctly presents science as having pragmatic goals and as being responsive to human problems. Conceived pragmatically the sciences are embodied sciences which can heal a suffering patient, not the disembodied pursuit of knowledge for its own sake. Second, Damasio uses a historical case study to emphasize the tentative character of science. By focusing on the history of phrenology, he can present brain science at its most fallible even as he introduces the impressive neuroimaging methods which have just become available. Third, he uses a contemporary case study not just to synthesize the many different levels of cognitive science, but also to emphasize that the care of the patient is a conversation among the different disciplines. His use of the metaphor of a conversation among the various cognitive sciences is not incidental. The decision to write philosophy in the rhetorical form of a conversation rather than in a purely expository form

is motivated by the fact that conversation is well suited to capturing the fact that no single brain science provides an ultimate grounding of cognition. Instead, responding to the genuine needs of the patient requires the different sciences must remain distinct voices in their dialogue with one another in order that the treatment have the best chance to succeed.

All of these rhetorical moves can prove useful as a model for other work in the philosophy of cognitive science. Doing embodied philosophy means much more than simply looking at evidence from brain science, or evidence from psychology and linguistics; it also means recognizing that there is no single standpoint which will give all the answers to problems about cognition. As Dewey foresaw, the minimum requirement of doing embodied philosophy is that it needs to recognize that there are multiple irreducible standpoints from which knowing is achieved. The power of Damasio's rhetoric shows us not only how we can conceptualize those multiple standpoints by animating the various cognitive sciences as different voices in a conversation, but also how these voices can be brought together around a human patient. Further, and as also Dewey foresaw, those voices must recognize their historic and temporal dimension and from it the likelihood that their best contemporary truths are at best contingent but useful responses to those human problems. Philosophy needs more normative models where the unifying idea is a pragmatic response to an embodied, and not a disembodied, conception of truth. One such model is Damasio's conception of the philosopher as a physician who remains in conversation with the various sciences while still being responsive to the patient. As such it is one kind of model that philosophy should strive to emulate. But an embodied

philosophy also needs to seek out other related metaphors as it builds its theoretical framework, and I now turn to discussing one of the best examples of rethinking the metaphors of the philosophy of science.

Embodiment and Lateral Transcendence

One of the few areas of philosophical discourse in which the relationship between argument and rhetorical form has been explored is in the feminist philosophy of science. As most of this dissertation has been focused historically, I have not yet discussed any of the burgeoning conversations in recent feminist philosophy which have extended Dewey's conceptions of embodied standpoints and analyzed the cultural and phenomenological experiences of embodiment. In this penultimate section of the dissertation I want to sketch out the connections between the kind of project I have been outlining on the cognitive science of embodiment and the compelling work done within feminist standpoint epistemology. This brief sketch, though painted with a broad brush, will help outline the vision of an embodied philosophy which is much more than a conversation about mind, brain, body. I will take as my touchstone to feminist philosophy an article on the embodiment of rationality by Linda Holler. After I present Holler's argument, metaphors and rhetoric, I will argue that her conception of "lateral transcendence" is a useful theoretical contribution for understanding how the various cognitive sciences come together.

Holler begins "Thinking with the Weight of the Earth: Feminist Contributions to an

Epistemology of Concreteness"[8] with a quote from Susan Griffith in which scientists--presumably physicists--discover their mortality. Their mortality lies in their connection to the Earth and to the Earth they must now return, as the theories of relativity and quantum mechanics have dashed their hopes of immortality. Scientific immortality came from a dream of an absolute frame of reference as seen from a pure, disembodied and idealized standpoint of knowledge; discoveries which fit into that frame would be ideas that would endure for all time, ensuring that that scientist's work and name would become immortal. I have already shown that this disembodied standpoint is often conceived as depicting a "bird's-eye" or a "God's-eye" view from above, so it should come as no surprise that Griffith portrays the discovery of the impossibility of an absolute frame of reference as the fall of the scientists from the vacuous heights of abstract physics to the concrete surface of the planet.

Holler begins the text of her article by interpreting Griffith's passage describing the fall. In what will be a striking contrast to the tone of voice she uses for most of the article, she begins by using a third person voice. From the point of view of merging rhetoric with argument, it is quite appropriate to tell the story of the impossible dream of ahistorical knowledge using an ahistorical, omnisicient narrative voice. As she describes how the project of setting science into an objective frame of reference fails, she explicitly adopts the disembodied voice of that that rhetorical form idealizes. Gradually, as layers of

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[8] Linda Holler, "Thinking with the Weight of the Earth: Feminist Contributions to an Epistemology of Concreteness," *Hypatia*, v.5. n. 1, 1990, pp. 1-23.

misguided presuppositions are laid bare, the voice in the article edges closer to the first person.

Holler draws a particularly insightful set of punning contrasts between the ordinary embodied "eye" and the "mind's eye." In the analysis she lays out, the "mind's eye" is the cogito, the first-person subjective "I" characteristic of the writings of Descartes and Galileo. In perpetually seeking to place the knowing agent at the standpoint of a disembodied, "God's-eye" view of the world, she argues that modern philosophy and science have replaced the eye of the body with a philosophic mind's eye. The ascent of the "I" was accomplished by Galilieo, Descartes and Newton, while she credits twentieth-century physicists like Bohr and Heisenberg with being especially influential in causing its fall. She argues that the twentieth-century work amounts to a rediscovery of "gravity," by which she means not only the physical force which would return Griffin's scientists to the Earth, but also the moral seriousness of the complex interrelationship that science and scientists have with their objects of study. Like the Czech author Milan Kundera does in his philosophical novel *The Unbearable Lightness of Being*, she undertakes a philosophical and literary reexamination of the conceptions of lightness and weight, of up and of down, in Western philosophy and science. Her article has an ambitious scope: finding the new metaphors and reworking the old metaphors for knowledge that are compatible with a conception of rationality as fundamentally embodied. Using the figures of gravity, the earth and downward motion to convey moral seriousness is just the beginning of her project imagining a coherent cluster of metaphors for knowledge to challenge the old metaphors.

These new metaphors cohere in what she calls an "epistemology of concreteness." Holler utilizes the transition between the third and first person literary voices within her text to mirror the fall from objectivity to concreteness. An authentic first-person voice does not actually emerge until near the end of the first section of the article, and when it does it is clearly preoccupied with the concreteness of an earth-bound perspective. When it finally emerges, she introduces her thesis as follows:

> I want to suggest that authentically objective and emancipatory voices can emerge only from within a life-affirming dialogue among free and unique beings. To combat the emptiness that exists on both sides of the subject vs. object dichotomy, we need the weight of the earth--a unifying idea of life which arises from the "gravity" of being aware of our connectedness to things. It is the earth's-eye view, not the one story seen from above, but many stories told from within, that renders knowledge objective, significant, and morally serious.[9]

She argues that in order to overcome the subject-object dichotomy engendered by disembodied science and philosophy we need not only an inversion of the traditional metaphors of lightness and weight, up and down, et al., but also a unifying idea of the interrelatedness (or connectedness) of life and knowledge. In the old model for knowledge that unifying idea was modeled on an objective frame of reference which took the idealized standpoint of the disembodied self observing astrophysical relationships between distant objects; by contrast she intends to replace that with a unifying idea modeled on relational framework with nearby objects of study and an acknowledgment of the interconnectedness of the knower to the objects of study.

There are two important threads from which Holler's epistemology of

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[9] Holler, "Thinking with the Weight of the Earth," p. 6.

concreteness is woven. The first is that the knowing self must begin with a self-reflective and embodied posture toward its objects of study. Holler argues that by beginning with the self-reflective thought "I am in the world," knowers can then approach the object of study as

> a particular being, a subject with whom one can engage in a dialogue. True vision cannot be achieved by looking *at* the world, as if from a distance, or by thinking about the world as a collection of *objects-in-general*. This means that the dialogue depends on knowers ... who can love the particulars in their freedom, without fearing the loss of self, and who respect the whole which embraces all particulars and is reflected within them."[10]

Notice how she contrasts her metaphor of a dialogue between the knowing and the subjects of study with the way the Knowing Is Seeing metaphor constructs the objects of study as phenomena accessible only at a distance. It is only by beginning with this kind of act of self-identification and hence a more humble posture toward the subjects to be studied, that the knowing self is construed as a part within a world which contains both knower and known. This posture is what leads to epistemological inquiry as a dialogue between knower and known where both are considered free and independent beings.

This last point leads directly to the second important thread of Holler's analysis. Within this dialogue, the world does not speak to us as objects-in-general but as concrete particulars. Part of what it means to engage in genuine dialogue is to delight in the places where we are surprised by the insights of the other or find that our own insights are resisted or changed during the course of our investigations due to the details. The point

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[10] Holler, "Thinking with the Weight of the Earth," pp. 6-7.

here is close to what I have already said about both John Dewey's view of experimental investigation as situated and the role of disanalogical results to scientific theorizing. In Dewey's terminology, genuine scientific investigation does *not* try to treat the subjects of study according to fixed, finished and final laws of nature, but instead as sources of uncertainty and contingency that pose problems for us as we live our lives. Understood as sources of both problems and solutions to our problems, the concrete particulars often surprise us and delight us. This is precisely what happens in real scientific theorizing, especially when an experiment like Müsseler's provides an anomaly within the current theoretical framework. The disanalogous results provoke live responses in the knowing agents, who must respond and accommodate their theories to the concrete details that the world-as-subject has provided. Good scientific theory is driven by a delight in the details, and especially when those details instigate a rethinking of the metaphors which constitute the theory. As Holler puts it, the dialogue between knower and known "depends on knowers who can rejoice in the fact that all beings revolt against the images imposed upon them."[11]

Lateral Transcendence in the Cognitive Sciences

In this chapter's discussion of Damasio's work I have claimed that his metaphor of the cognitive sciences as the interdisciplinary conversation surrounding a particular patient's case study is an important rhetorical move that philosophy should strive to

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[11] Holler, "Thinking with the Weight of the Earth," p. 7.

emulate. Holler's work gives us a broader theoretical framework to understand why Damasio's use of the metaphor of a conversation is morally serious business. The metaphor of a patient-centered conversation not only connects together the differing levels of investigation in cognitive science, but it brings them together as if the stories were being told in direct response to our own concerns and questions about our friend, the patient. That the life of the patient, in terms of his or her regaining successful functioning, hangs in balance on the philosophical and scientific story being told shows just how dramatically knowledge of the particulars of neurons, of various psychological experiments and of the functions of the neuroanatomical regions is not something independent from life, but is instead interrelated with life.

Holler offers the term "lateral transcendence" as an alternative vision to understand this kind of converging dialogue that both brings together knowledge collected from diverse standpoints. Holler writes that:

> Because this dialogue aims at maintaining the worlds voices and our own voices, it might be best to describe the knowing act under the rubric of *lateral transcendence*--lateral, because this process holds within it the weight of the earth; transcendent, because knowing is not bound to what has been traditionally called the subjective, that is the personally opinionated, or dogmatic. Lateral transcendence is a mode of transcendence based on being-in-relation-to, which, by rendering the knower incarnate, lessens the temptation to abstract things from concrete space and time. It does not assume that we can get beyond our constructions, yet it begins with a vision of the oneness of things which preserves the moral--and indeed the scientific--integrity of both self and other.[12]

The transcendence is lateral because it does not seek to find a single overarching

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[12] Holler, "Thinking with the Weight of the Earth," p. 10.

explanation, but instead seeks to make connections among what our many conversations with the world tell us. Lateralness implies that we must recognize that we lack the idealized standpoint from which all things may be known--what Holler means by the phrase "thinking with the weight of the earth." The weighty, concrete particularities of the world are instead what make our explanations possible, and our best explanations are tethered to those particularities. Because of their tethers to the particular content-laden experiences that gave rise to them, such explanations are not reducible to one another.

It is equally important, however, to see that in order for the pursuit of knowledge to be morally serious there must be unifying goals, such as reducing the suffering of a patient, which require finding convergences between the particularities and concreteness of the multiple independent explanations. For example, cognitive neuroscience explanations using neuroimaging models depict "average" brains which stochastically account for very concrete variations in particular sizes and weights of individual brains. Similarly, in developmental neuroanatomy there is a concept of "normal" brain development which may be frustrated or impeded in ways that result in various neurological disorders, yet that concept of normal development is not a precise abstract form which can predict the development of any particular individual brain in every detail. But these models are crucial tools in both the training and the real-time thinking of the neurosurgeon who has to operate in a crisis situation on an injured patient with a particular individual brain. Not only are the convergences within the subjects of study important to explanation, but so are the meta-level convergences among the various independent explanations. Such convergences are, in Holler's language, transcendent.

Thus it is equally important to see that Holler's conception of the laterally situated explanations also requires that such knowledge be transcendent. As she puts it, "knowing is not bound to what has traditionally been called the subjective"[13] but instead recognizes that knowledge begins with a conception of the participatory oneness of knower and known. In my discussion of Dewey I have argued that in giving an embodied philosophy of cognitive science we cannot separate mind from brain or brain from body, as in all of these cases it is an interactive coordination of the knowing subject with the known objects that produces cognition. Similarly, in my analysis of the two main lines of work within conceptual metaphor and the embodiment hypothesis in cognitive science, I have argued that we must take the project of analyzing *how* the conceptual metaphors of cognitive neuroscience work as seriously as we take the project of knowing *what* metaphors might be within cognitive neuroscience. The reason we must bring this "how" together with this "what" into what I have called the "Big Picture" framework is that researchers must cognize as they study cognition. We are always participating in the activity of knowing even as we study cognition as what we would like to know.

"Lateral transcendence" is a much better term for what an embodied philosophy of cognitive science seeks to do than the "vertical convergence" of different levels of investigation. Throughout the previous chapters of the dissertation I have been arguing for conceptualizing cognition as something which occurs on multiple interrelated levels of investigation, as in the framework I proposed in the fourth chapter. In that discussion I

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[13] Holler, "Thinking with the Weight of the Earth," p. 10.

have already pointed out some of the ways in which the metaphors of the "top" and the "bottom" levels of cognition can be grossly misleading. However, Holler's insights into the values with which our conventional metaphors of "lightness" and "weight" and of "high" and "low" are traditionally imbued point out that it might be better to do away with the metaphors of verticality embedded in such frameworks, and replace them with notions of laterality. For example, when I argued in chapter five that Kosslyn's cognitive neurosciences triangle made better sense of the role of neurocomputational modeling than Lakoff and Johnson's "neurocomputational level," the reason it did so was that it put modeling *alongside* the neurobiology it modeled. Our investigative methodologies are best conceived as paralleling our embodiment, not as a bridge between cognition and biology.

Holler provides us with some alternatives to verticality metaphors, arguing that we should replace such rhetoric with metaphors drawn from lateralness. The reason we should replace metaphors drawn from verticality with those of lateralness is that in the cognitive sciences we are trying to connect investigations which both all require each other in times of crises and yet are all speaking independently of one another. One does not have scientific inquiry into neurons and neurotransmitters at all without the widest context of cultural cognition, as science itself takes place at the interpersonal and cultural level of cognition. Nor does one have scientific inquiry without having a genuine dialogue with a world disclosing particular portions of itself given the kinds of questions asked. There are real tumors, real iron spikes, and real brain regions which are damaged. There are also real emotions, real feelings, and real moral judgments. Moreover there are real

conceptual ideologies, real oppressive social forces and real crimes against humanity. And there are also connections between the analyses of all of these knowable parts of the world which lead back to ourselves as knowers.

Conclusion: The Importance of Rhetorical Form

The kind of attention I have been giving to how rhetorical form and the substantive arguments of Damasio and Holler proceed apace have generally escaped serious philosophical consideration. That omission is a legacy of the classical conception that philosophy and science were to have a particular rhetorical form: exposition, which tries to set everything out as single unified body of knowledge as seen from an idealized standpoint. As in the case of metaphor, philosophers have traditionally thought that all rhetorical concerns are *merely* rhetorical and hence nonessential to the substance of the argument. However, embodied philosophy requires using a rhetorical form capable of conveying the genuine dialogue between the different voices of the various levels of investigation within the cognitive sciences.

Damasio's rhetorical framework of a conversation with its natural byways and diversions is one successful example of a rhetorical form which animates multiple voices. As I suggested in chapter five, here the guiding metaphors for philosophical inquiry would be the philosopher as physician and philosophical argumentation as a conversation among the physicians. Holler provides yet another rhetorical framework in which she blends philosophical allegory with philosophical argument. Out of it, she gives us a rubric, lateral

transcendence, which suggests the ways that we might recast the old metaphors of the upper and lower levels of cognition as instead earth-bound standpoints from which the various voices of the cognitive sciences speak. Rethinking both rhetorical form and the philosophical metaphors which guide inquiry are essential tasks.

An embodied philosophy needs to continue to develop the rhetorical forms and metaphors proposed by Damasio and Holler. Reimagining the metaphoric underpinnings of science is not an easy task, but it is necessary for philosophy to take on this task. We need both what Holler calls a unifying idea and yet that unifying idea must be flexible enough to allow for dialogue within multiple perspectives on science. Damasio's neurological patient is an example of one such unifying idea, and it lead to a model of the philosopher as physician, but there are undoubtedly other fruitful models. For example, I began this dissertation with a defense of philosophical paradoxes as an appropriate rhetorical form for philosophical thought. Paradoxes do allow for multiple interpretations, and yet they also seem to hint that there is some deeper resolution which can bind those interpretations together. Used well, rhetorically framing philosophical inquiry using paradoxes also still holds promise as a viable method for embodied philosophy--because the point that philosophical inquiry is constituted by metaphors fundamentally means that philosophers need to remain self reflective about what metaphors are guiding their inquiry. What does not hold much promise is for philosophy to continue along using the decontextualized "A-knows that-O" rhetorical form.

In my own view, philosophy has always been about attending carefully to the consequences of the metaphors we use as we do philosophy. Even as classical philosophy

tried to systematically exclude metaphor from philosophy, its failure to do so rests on the fact that philosophical thought is intrinsically metaphoric. Metaphors impart crucial structure to our abstract philosophical and scientific argumentation by extending our embodied patterns of reasoning to cover new domains of experience, which in turn requires that we consciously think through where a particular metaphor guides us well and where it leaves us lost. More and more of contemporary philosophical thought is beginning to wake up from a long and dark slumber and take note of the crucial role metaphor plays in reasoning, though all too often philosophers still must be dragged from their hibernation in a classical cave. But even on this Platonic stage, Heraclitus' role as the one who philosophically awakens the others is being played by pragmatists, feminist philosophers of science, and cognitive scientists who work on metaphor and the embodiment hypothesis. They are some of the key players who are making us aware of the interconnectedness of metaphor, rhetorical form and genuine philosophical inquiry.

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