Introduction to the Philosophy of Cognitive Science

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Chapter 2
Greek Metaphysical Speculation: Philosophical Materialisms and Dualisms

2.1 Introduction

It may seem odd to the contemporary thinker to suppose that people did not always have a clear conception of the mind and of mental phenomena. Nevertheless, like most contemporary western concepts the development of the notion of the mind and of mental phenomena actually occurs over the course of centuries. Indeed, the development of the notion of "the mind" arguably traces back to the development of the Greek notion of the soul. For most of Greek history the conception of the soul bears little resemblance to its contemporary western counterpart. In fact, the Greeks develop their notion of the soul as part of the development of general ontological frameworks for scientific and metaphysical speculation. Three features of the development of the Greek notion of the soul figure prominently in this rather superficial history. First, the development of the Greek notion of the soul represents a slow accretion of properties and processes associated with three different contemporary distinctions into a single ontological entity; living vs non-living, animate vs inanimate, and mental vs non-mental. Second, as the soul becomes more distinct both in its nature and in its functions, the Greeks begin to more actively debate whether the soul constitutes a fundamental kind of stuff (a distinct substance) or merely one of many permutations of more fundamental kinds of stuff (substances). For instance, early Greek thinkers often supposed that the universe consists of various permutations of one or more fundamental elements. Thus, these thinkers do not tend to classify the soul as fundamentally different from those elements that compose the material world. Third, with the notable exception of Descartes, thinkers from Thales through the British Empiricists tend to allow themselves a considerable degree of ambiguity within their explanatory and theoretic frameworks as regards the nature of the soul and its relationship to (place in) their respective overarching ontological frameworks. Later I refer to this ambiguity regarding the exact position of the mind within the various ontological frameworks as tenuous dualism. The tenuous dualist seems to treat the mind (or soul) differently than other elements of their ontological framework. More specifically, tenuous dualists tend to think of the mind (or soul) as having properties or relationships that prove inconsistent with the categories and categorical relationships of their ontological framework. For instance, Aristotle seems to adopt a monistic physicalist (see below) ontological framework in which physical objects are a union of matter and form. However, he seems to violate that framework when discussing the soul (see below).

2.2 Monism and Pluralism

In this and future chapters I use the terms "monism," "dualism," and "pluralism" in a slightly different fashion than they are normally employed in the philosophy of mind. Before introducing my idiosyncratic use, I'll briefly outline the standard uses of these terms. In the philosophy of mind the terms monism and dualism tend to apply to the fundamental category of substance and derivatively to the properties of substances. Specifically, substance monism holds that only one type of substance exists--there is only one kind of entity in the universe. According to substance monism all of the universe's phenomena-- both mental and physical phenomena--result from some sort of modification or permutation of a single kind of entity. The two most

common versions of substance monism are monistic physicalism (also called physicalism or materialism) and monistic idealism (also called idealism). Monistic idealism holds that mental substance constitutes the only entity in the universe. Monistic physicalism holds that physical substance constitutes the only entity in the universe. Philosophers of mind normally contrast substance monism with substance dualism. Substance dualism posits the existence of two fundamental kinds of substance-- mental substance and physical substance. In general, substance dualists assert the existence of two fundamental kinds of substances on the grounds that a single substance cannot explain both mental and physical phenomenon. Thus, substance dualists claim that all mental phenomena result from modifications or permutations of mental substance. All physical phenomenon, in contrast, result from modifications or permutations of physical substance. Importantly, substance dualism holds that mental substance and physical substance are irreducible to one another. The monistic physicalist faces the challenge of explaining how *prima facie* nonphysical mental phenomena result from modifications or permutations of physical substance. Similarly, in the monistic idealist faces the challenge of explaining how *prima facie* non-mental physical phenomena result from modifications or permutations of mental substance. He substance dualist, on the other hand, remains free to explain mental phenomena as permutations are modifications of a mental substance and physical phenomena as permutations or modifications of a physical substance. However, the dualist must explain the *prima facie* causal interaction between mental and physical phenomena given that mental substance cannot cause or bring about physical phenomena and physical substance cannot cause or bring about mental phenomena.

In this text I'll use the term “monism” to refer to the supposition within an ontological framework of a single fundamental category to fill a specific role. Thus, monistic physicalism and monistic idealism count as monism in that they posit a single kind of entity within an ontological framework. I'll use the term “dualism” to refer to the supposition within an ontological framework of exactly two fundamental categories to fill a specific role. Substance dualism, as a result, counts as a dualism. I'll use the term “pluralism” to refer to the supposition within an ontological framework of more than two fundamental categories to fill a specific role. Examples of pluralism include forces in physics and that contemporary physics posits the existence of four fundamental forces; gravitation, electromagnetism, strong nuclear force, and weak nuclear force. An unconventional consequence of this specific application of the terminology comes when one considers properties. On the conventional interpretation property dualists assert two fundamental kinds of properties--mental properties and physical properties. Property dualists hold that mental and physical properties are irreducible to one another despite the fact that both categories of properties are properties of a single underlying substance. On my view, all philosophers of mind are property pluralists and that they posit the existence of more than two fundamental kinds of properties. For instance, substance dualists posit the existence of at least three fundamental categories of mental properties--belief, desire, and qualitative conscious experiences--in addition to positing any number of fundamental categories of physical properties. Monistic physicalists deny fundamental categories of mental properties, asserting that mental properties reduce to physical properties. Nevertheless, monistic physicalists posit the existence of multiple fundamental categories of physical properties and thus count as property pluralists in my nomenclature.

Students who find the above discussion of the confusing can rest assured that these specific positions will emerge repeatedly throughout the discussion in this chapter. Furthermore, I have included a glossary at the end of this chapter to further facilitate student in understanding of these terms.

2.3 The Development of Greek Ontological Frameworks

Two main ontological frameworks emerge early on in Greek thought; monistic physicalism and what I call oppositional dualism. Monistic physicalism holds that all objects, properties, processes, etc., including those associated with the mind and life, belong to a single kind of substance, physical substance. As a result, all theories within the monistic physicalist framework categorize their target phenomena using physicalistic categories and construct theories for phenomena from those physicalistic categories. For instance, Thales proposes that water is the basic element and seeks to explain how all other objects, properties, processes, etc. result from water and its properties. Dualism (or more generically, pluralism) asserts that there are two (or more) fundamental kinds of substance, and that each substance has its own characteristic properties. For instance, Anaxagoras[1](500-428 BCE) of Clazomenae (an area in Turkey in Asia Minor) appears as the ultimate pluralist, holding that all types of materials—from milk to gold—constitute distinct eternally existing substances with their respective characteristics.[2-4] Empedocles[5](490-430 BCE) of Agrigentum (now known as the city of Agrigento in Sicily) appears likewise to adopt a pluralism. Empedocles posits the existence of the basic four elements (earth, air, fire, and water) together with two forces, love for combining and strife for separating these elements to create other materials. [2, 6]

Dualists and other pluralists assert the existence of two or more distinct kinds of substance. Each kind of substance has an ineliminable role in explaining some class or classes of objects, properties, processes, etc.. I use the term oppositional substance dualism to refer to those dualisms that assign opposite or fundamentally different properties to each kind of substance. For instance, the Greek philosopher Plato articulates an oppositional dualism of forms and sensible objects. Plato supposes that forms do not change and admit of no parts. Sensible objects, in contrast, change and can have parts. The most famous oppositional dualism is substance dualism or mind-body dualism. Substance dualism supposes that to understand and explain minds, their properties, processes, etc. requires the supposition of a mental substance having only mental properties. Likewise, that to understand and explain physical objects, properties, processes, etc. requires the supposition of a physical substance having only physical properties.

Additionally, the development of the Greek notion of the soul illustrates a common dilemma that theorists have faced throughout the historical development of theories of mind: (D1) Monistic physicalist theories face the difficulty of formulating physical mechanisms that plausibly explain various mental properties and processes. In contemporary times many researchers allege that, qualitative consciousness (viz., conscious experiences of red) represents such a mental process. For instance, David Chalmers argues that qualitative conscious experiences resist explanation by known physical mechanisms. [7-9] He tells readers that, [7]

> The really hard problem of consciousness is the problem of *experience*. When we think and perceive, there is a whir of information-processing, but there is also a subjective aspect. … It is undeniable that some organisms are subjects of experience. But the question of how it is that these systems are subjects of experience is perplexing. Why is it that when our cognitive systems engage in visual and auditory information-processing, we have visual or auditory experience: the quality of deep blue, the sensation of middle C? How can we explain why there is something it is like to entertain a mental image, or to experience an emotion? It is widely agreed that experience arises from a physical basis, but we have no good explanation of why and how it so arises. Why should physical processing give rise to a rich inner life at all? It seems objectively unreasonable that it should, and yet it does. (¶ 8 &9)

In contrast, (D2) dualist oppositional theories like substance dualism face the difficulty of formulating accounts of how two fundamentally different types of objects could possibly interact in such a seemingly continuous and seamless fashion. Substance dualist theories generally face difficulties in explaining mental functioning in that, by its very nature, mental substance does not obviously have any mechanistic or causal elements. Indeed, many of the marks by which we identify causation are absent in mental substance. Mental substance lacks spatial dimensions (thus spatial proximity) and has no parts on most accounts (having no spatial dimensions). Hence, one cannot explain the actions of minds by the interaction of the component elements of their mental substance. Even temporal coordination can seem sketchy: Did one's desire for that candy bar cause one's going to the store, or did the two events have a common cause, say the candy bar. Perhaps the two phenomena merely prove temporally coextensive, without any direct causal interaction at all, just as the times on people's watches remain coordinated without causally interacting with one another.

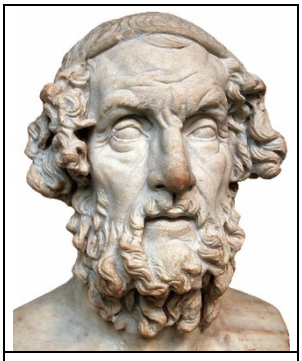
2.4 The Greek Notion of the Soul During the Presocratic Period

The outline of the narrative regarding the Greek notion of the soul goes as follows: The idea of a single unified thing—the mind--emerges over time from the notion of the soul. To have a notion of the mind theorists must come to a general consensus regarding two issues: (1) Theorists must come to suppose that the diverse set of phenomena scientists now consider mental processes and properties form a common, interrelated set of phenomena—a domain. Call this the domain hypothesis. (2) Theorists must come to suppose that those interrelated processes and properties have a common locus—that there is a single thing that has mental properties and where mental processes occur. Call this supposition the common locus hypothesis. This chapter chronicles the evolution of a consensus with regard to the domain and common locus hypotheses. People often express surprise upon discovering the relative recency and lack of ubiquity of the notion of a single entity responsible for all the phenomena we associate with mentality. However, the mind is, in fact, a relatively recent invention. For example, Fyodor Dostoyevsky's underground man gives a common alternative explanation for his temperament—a mental property--in the opening passage of *Notes From the Underground*: "I AM A SICK MAN.... I am a spiteful man. I am an unattractive man. I believe my liver is diseased." [10] The underground man's explanation of his spitefulness by reference to liver disease was not uncommon at the time. Likewise, the early Greek philosophers often did not associate processes and properties now commonly considered mental with the mind, nor did they offer particularly mental explanations for these processes and properties.

In short, the soul does not begin in Greek thought as a single entity having mental properties and where mental processes occur. The soul begins as the locus of the distinction between living and non-living things. Living things have a soul, whereas non-living things are bereft of souls. As Greek thinkers continue to reflect upon the nature of the soul one sees these thinkers start to associate the soul with the distinction between animate and inanimate things. That is, possession of a soul comes to differentiate those things capable of exhibiting self-generated movements from those things incapable of such movements. Early Greeks distinguish animate from inanimate things in that animate things generate movement whereas inanimate things move only as a result of the transmission of motion, e.x., when a moving ball transmits its motion to another ball with which it collides. Eventually, Greek thinkers come to envision the soul as the common locus of mental processes and properties. By the time Plato and Aristotle pen their works, the core processes of the contemporary notion of the mind—reasoning, sensation, perception, ambulance, and emotion—all plausibly reside within the human soul. However, the Platonic and Aristotelian souls still form the basis for the

distinctions between living and non-living as well as the more basic Greek notion of animate and inanimate. Thinkers in the Hellenistic period, like Epicurus and the Stoics, move towards conceiving of the soul as the locus of mentality, differentiating mentality from other aspects of life and alternative causes of motion. However, the association between mentality and mortality—or often immortality—persists even today. Thus, the development of the notion of a mind involves the association of various properties and processes as having a common nature (the domain hypothesis) as well as the association of those properties and processes with a single entity (the common locus hypothesis). Additionally, theorist must also disentangle other properties and processes from that entity. Call this the mental distillation hypothesis.

Perhaps the earliest mention of a soul in Greek literature occurs in the epic poems of the Greek poet Homer.[11, 12] These poems, the *Iliad* and the *Odyssey*, exert a strong influence on early Greek culture. Scholars commonly suppose that Homer lived and wrote in the 8th or 9th century BCE, though speculation has placed his life as far back as the 12th century BCE. In the *Iliad* and the *Odyssey* Homer refers to the soul as an entity unique to humans that gives life with its presence and death with its absence. The soul leaves the body at death, continuing to exist in the underworld as a shade or image of the person. In fact, as late as the 5th century BCE the most common Greek words for soul, thumos (θυμός) and psyche (ψυχά) translate as alive, breath, and spirit.[11-14]



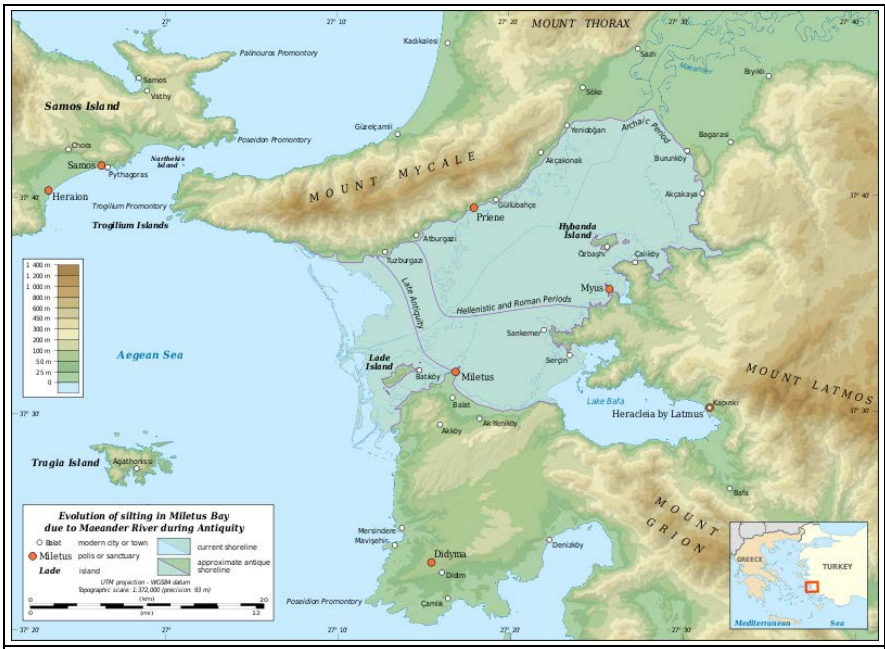
Idealized bust of the Greek poet Homer in the British Museum. From: http://en.wikipedia.org/wiki/File:Homer_British_Museum.jpg

Many ordinary Greeks and religious thinkers of the time likely believe in immortal souls, just as people today. Indeed, a 2009 Harris online poll found that 71% of the survey subjects indicate belief in a soul that continues to exist after death. Only 10% profess disbelief in such a soul. In contrast, only 45% express belief in evolution.[15] For the Greeks in Homer's time the soul is a uniquely human, quasi-physical entity the presence or absence of which marks the distinction between life and death in humans. During the centuries that follow Homer's writings, the Greek notion of the soul undergoes an expansion: both in terms of the sorts of entities that can possess souls and in terms of the functions that Greek's attribute to the soul.

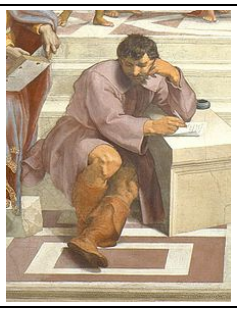
Discussion of the soul continues in early Greek philosophy, though few Greek philosophical texts exist today. Most of what contemporary scholars know about the early Greek philosophers comes from surviving fragments of their writings and reports of their views in the works of later writers. For example, scholars often identify Thales of Miletus (624-546 BC) as the first philosopher in the western tradition, and Miletus (a city on the coast of present-day Turkey) as western philosophy's point of origin. Scholarly knowledge of Thales comes from doxographic evidence, i.e., discussions of his views in other writers. The primary source of information about Thales comes from the Greek philosopher Aristotle.[2, 13, 16-18]

Early Greek philosophy tends not to distinguish strongly between different areas of inquiry. For instance, early Greek philosophers do not distinguish philosophy from what one now thinks of as science and mathematics. Indeed, Thales' thought seems to include aspects of observation-based astronomy as well as more abstract "philosophical" theoretical speculation. To wit, Thales reportedly predicts a solar eclipse in 585BCE, an accomplishment that moves many researchers to identify Thales's work as marking the beginning of western science in addition to philosophy.[13, 16]

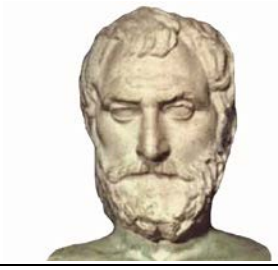
Thales, like many of the earliest (Presocratic) Greek philosophers, adopts a monistic physicalistic ontological framework. Thales provides a model for other early Greek philosophers in that he articulates a general theoretic framework for understanding all phenomena within monistic physicalism. Specifically, this early Greek theoretic framework seeks to understand and explain all phenomena—objects, properties, processes, etc.—by positing one or more basic elements and explaining all phenomena as manifestations of that (those) element(s). Thales forwards the hypothesis that water is the basic element and seeks to explain how all other objects, properties, processes, etc. result from water. Thus, one can understand Thales and the other early Greek philosophical thinkers as attempting to develop a general monistic ontological framework for understanding the world. Thales and most of the early Greek philosophers are physicalists (materialists), holding that all that exists is matter and the void. As a result, Presocratic theories about the soul presuppose



Map showing Miletus from http://commons.wikimedia.org/wiki/File:Miletus_Bay_silting_evolution_map-en.svg



Painting of Heraclitus from
Raphael's School of Athens



Bust of Thales (624-546BCE) from
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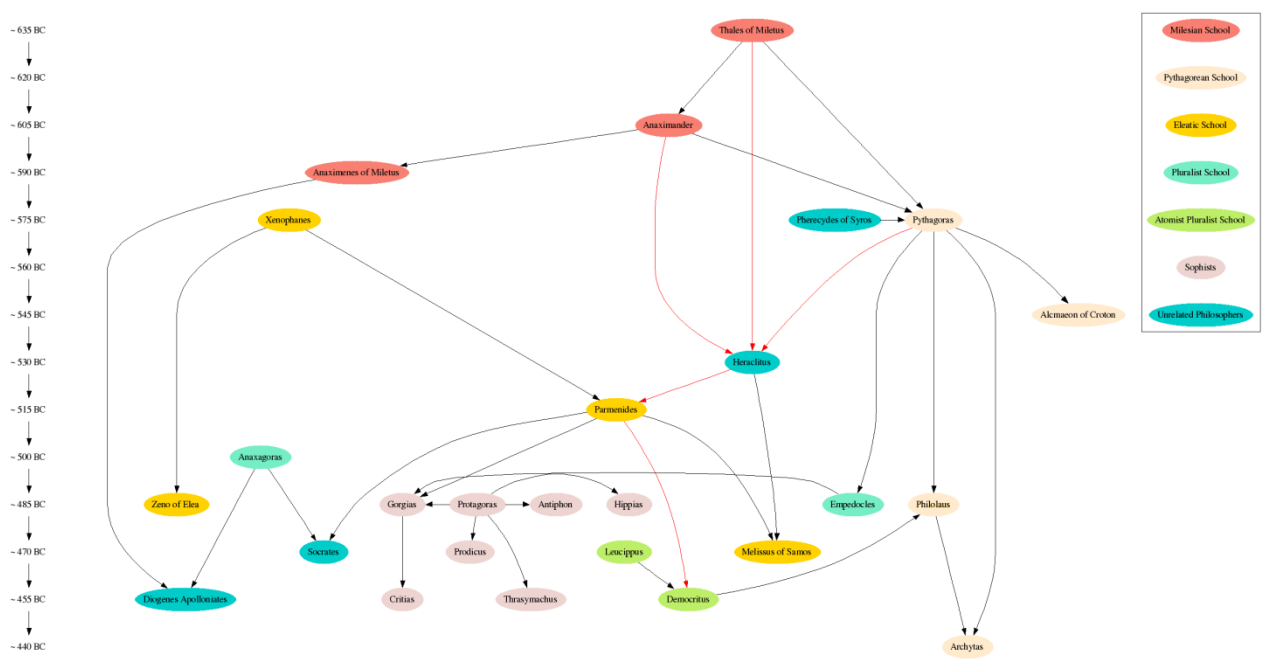

Diagram depicting the timeline as well as the interrelationships between the various pre-Socratic Greek philosophers and their schools. From:
http://upload.wikimedia.org/wikipedia/en/e/e2/Presocratic_graph.png

its physical nature. For instance, Aristotle reports in *De Anima* that "Thales, too, to judge from what is recorded about him, seems to have held soul to be a motive force, since he said that the magnet has a soul in it because it moves the iron."(Book 1, Part 2, Paragraph 14)[19] Thales thus expands the function of the soul to include causing movement, specifically self-generated movement, as well as expanding the kinds of potentially ensouled the entities. However, one must distinguish animation from ambulation and other sorts of motor movements in early Greek thought. Animation applies to all self-generated movements. For instance, the Greeks think of the planets as animate objects. In contrast, ambulation refers to self-generated movements resulting from motor skills and intent—like walking. Thales does not seem to suppose that magnets have the ability to ambulate, though they do count as animated.

Similarly, Heraclitus (535 to 475 BCE) of Ephesus proposes fire as the most basic element, speculating that the soul consists of fire or air. Heraclitus also suggests that control of motor functions emanates from the soul and follows Pythagoras (570 to 490 BCE) in linking wisdom to the soul. Thus, for Heraclitus the fiery nature of the soul means that mental and motor functions deteriorate if the soul becomes wet; "A dry soul is wisest and best. … A man when he is drunk is led by an unfledged boy, stumbling and not knowing where he goes, having his soul moist." (Fragments 230 & 231, p.203)[20] Pythagoras (570 to 490 BCE)[20, 21], Anaxagoras (500-428 BCE)[3, 4], Empedocles (490-430 BCE)[6], and Democritus (460-370 BCE)[22, 23] all propose that plants and animals have souls. Thus, by the end of the 5th century BCE the Greek notion of the soul consists in a physical, albeit rarified, entity that serves to explain the difference between living and non-living things. The soul likewise causes self-generated motion, emotional responses, and thought.

2.4 Specialized Greek Philosophy Tracts Emerge and Dualism Becomes Less Tenuous

Around 400 BCE philosophers who have grown up within the general Presocratic monistic ontological framework for understanding the world, like Plato (427-347BCE) and Aristotle (400-320BCE), begin to write works covering more or less specific areas of inquiry. They also spend significant time considering investigative methodology. Both of Plato and Aristotle contribute to the development of two general areas of inquiry that dominate thought about the mind for the next several centuries: Epistemology (the sub-discipline exploring the nature, sources, & limits of knowledge) & Philosophy of Mind (the sub-discipline exploring the nature of the mind). Indeed, Plato, writes the *Meno* [24] and later the *Theatetus* [25], both of which prove influential in epistemology. In writing works addressing specific topics, he alters the status quo by offering entire works on a single philosophical topic or sub-specialty. Similarly, though the various lootings and burnings of the library of Athens result in the destruction of most of Aristotle's actual texts, *Nicomachean Ethics*, shows a similar topical focus.[26]

Plato (427-347BCE) | Aristotle (400-320BCE)

2.5 Epistemology Multiplies Ontology

Epistemic ruminations date back to the Presocratics and continue today. However, the reflections of the Presocratics upon epistemology appear as part of more general discussions. With Plato one starts to see texts

with specific topical foci and the emergence of two general types of epistemological questions: On the one hand, one can ask how one can (or ought to) go about generating knowledge or evaluating knowledge claims about some topic. For instance, there are two general epistemic questions in the philosophy of mind: (A) How, and to what extent, can one know about one's own mentality? Theorists often call this the problem of self-consciousness or the problem of self-knowledge. (B) How, and to what extent, can one know about the mentality of others? Theorists often call this the problem of other minds. For the purposes of this class one can think of the first type of epistemic questions--questions regarding the sources of various kinds of knowledge about the mind--as seeking to understand and/or clarify how one might come to know of the existence and nature of mental functioning. Answers to these questions provide a framework through which theorists attempt to gather evidence in order to better understand the nature of the mind and its functioning.

On the other hand, one can ask questions about the nature of knowledge and what distinguishes knowing from other states. One can think of these questions as concerned primarily with the nature and function of knowledge in cognition. Plato primarily seeks answers to the most central of this second class of epistemological questions; "How can creatures come to know about the nature of the world?" Indeed, all of Plato's works are informed by his answer to the above epistemic question: Plato supposes that creatures come to know the nature of the world via knowledge of another kind of world—the intelligible world. For Plato, the sensible world is inherently flawed insofar as the objects of the sensible world appear to retain their identity despite changing their properties over time and in relation to one another. Indeed, for Plato the most despicable feature of objects of the sensible world lies in their ability to admitting of contradictory properties. For instance, in the *Theaetetus* Socrates suggests that the same wine can seem sweet to a healthy sommelier and bitter when that same sommelier becomes sick. Yet, the same entity cannot be both bitter and sweet because sweetness and bitterness contradict each other. In order to make sense of knowledge, Plato supposes that knowledge comes from recognizing the constancy amidst the ever-changing flux of the sensible world—the reality under the diverse and seemingly inconsistent sensations.

For Plato constancy comes from the entities in the intelligible world, i.e., the forms. Unlike the changeable entities of the sensible world, the changeless forms admit of no contradictions either over time or in relation to one another. Objects of the sensible world remain constant insofar as they "partake" of the forms. Thus, the sensible wine partakes of the form of wine and so remains constant as wine and the sommelier can know it as wine. But the wine only "partakes" or "participates" in the form of wine, making it imperfectly wine. This imperfection allows the sensible wine to seem both bitter and sweet to different people or to the same person at different times.

Beginning as early as the *Phaedo* [27], Plato outlines a theoretical framework that construes the sensible world and the intelligible world as fundamentally distinct. He characterizes entities in the former as perceptible, changeable, and destructible aggregates, while the entities of the latter realm prove imperceptible, changeless, and indestructible unities. (¶77-81)[27] Though Plato does not equate the soul with the forms, he does tell readers that, "…the soul commands, the body serves: in this respect too the soul is akin to the divine, and the body to the mortal." (¶80) [27] Thus, Plato's dichotomy between the sensible and the intelligible introduces a much more robust dualism than that of the Presocratics—a dualism of ontological kinds sharing no essential properties—an oppositional dualism. Nevertheless, one still sees Plato exhibit a considerable laxness when it comes to locating the soul within his dualist framework.

2.6 Theoretical Explanations of Mental Functions

In *The Republic* [28], a work he devotes primarily to political philosophy, Plato introduces yet another highly influential view--the tripartite division of the soul. The doctrine of the tripartite division of the soul builds upon the expansion of the soul's functions in the works of the Presocratics and informs a great deal of future thought regarding the nature of the mind and its operations. According to Plato the soul has three parts; the appetitive soul, the spirit or passionate soul, & the thinking or rational soul. Each element of the soul has its own characteristic desires. The good for humans consists in the subjugation of the appetitive soul to the passionate soul, which is in turn subjugated to the rational soul. Thus, reason, emotion, and appetite become separate in Plato. One might argue that this represents the first attempt to understand the mind in terms of constitutive elements of the mind, the functions they perform, and the relationships that emerge. Interestingly, this theory of the soul supposes that the soul has properties that the forms cannot possess. Specifically, the forms are changeless and indivisible while Plato's tripartite soul proves both changeable and divisible. Thus, Plato also exhibits a version of tenuous dualism with regard to the soul.

Plato's tenuous dualism results from the difficulties Plato has in accommodating the soul as he understands it within the categories of this ontological framework. Plato's ontological framework consists of an oppositional dualism between the objects of the sensible realm and the objects of the intelligible realm. Plato supposes that in order to understand the sensible world one must suppose that two fundamental categories of entities exist-- sensible objects and forms. Though the sensible objects partake of the forms their central properties contradict the central properties of the forms. Thus, sensible objects admitted division whereas the forms do not. Sensible objects change whereas the forms remained changeless.

When Plato contemplates the soul within the context of his oppositional dualism, his inclination is to place the soul within the fundamental category of the forms. However, in order to understand the operations of the soul Plato supposes that the soul has parts and that these parts interact (i.e. change). As a result, Plato categorizes the soul as a form yet attributes to the soul any of the properties definitive of the category of sensible objects. Since the soul does not fit well into either of the fundamental categories of Plato's ontological framework, Plato's treatment of the soul seems to implicitly or tenuously place it into a third, different fundamental category.

2.7 Aristotle

In *De Anima* [19], Aristotle considers human mentality and the human soul. But, he also considers the nature of the souls of all living creatures. Indeed, *De Anima* includes discussions on methodology, the senses, as well as thought and reasoning. Aristotle seems to return to the materialistic framework of the Presocratics in that he denies that the form of an object constitutes a distinct entity. Rather the form "blends" with matter to create an individual entity having those characteristic properties and capacities resulting from the blending of form and matter. However, in *De Anima* Aristotle appears to make an exception for the soul within his overall theory of form and matter.[19]

> Therefore, since everything is a possible object of thought, mind in order, as Anaxagoras says, to dominate, that is, to know, must be pure from all admixture; for the co-presence of what is alien to its nature is a hindrance and a block: it follows that it too, like the sensitive part, can have no nature of its own, other than that of having a certain capacity. Thus that in the soul which is called mind (by mind I mean that whereby the soul thinks and judges) is, before it thinks, not actually any real thing. For this reason it cannot reasonably be regarded as blended with the body: if so, it would acquire some quality,

> e.g. warmth or cold, or even have an organ like the sensitive faculty: as it is, it has none. It was a good idea to call the soul 'the place of forms', though (1) this description holds only of the intellective soul, and (2) even this is the forms only potentially, not actually. (Book III, part 4, paragraph 3)

Aristotle describes the soul, not as informed, but as 'the place of forms', making the soul unlike other individual entities (e.x., the body). This designation seems to qualify Aristotle as a tenuous dualist in that the soul appears to fall outside the framework of his monistic physicalism. That is, Aristotle treats the soul in a way that makes it the one thing within his ontological framework that is neither matter, form, nor informed matter. Aristotle's tenuous dualism results from a difficulty that emerges again and again for monistic physicalist theories of the mind and its function, namely the difficulty in formulating a monistic physical theory that seems to explain mental functioning. As with many of the Presocratic philosophers, Aristotle hypothesizes that plants possess souls allowing them to gain nourishment and reproduce. Animal souls have the additional capacities of sense perception and ambulation. However, only human souls have the capacity for intelligence, and only the intelligent aspects of the soul are immortal and for Aristotle.

2.8 Chapter Summary

This chapter pursues two expository goals. On the one hand, the chapter builds upon the notion of an ontological framework even in Chapter 1. Specifically, this chapter introduces various ontological frameworks based upon different fundamental categories of substance. On the other hand, the chapter develops a sketch of how the Greek notion of the soul evolves into an entity from which one can extract the contemporary notion of the mind.

2.9 Glossary of Key Terms

Dualism: According to Wallis, dualism refers to the supposition within an ontological framework of exactly two fundamental categories to fill a specific role. Substance dualism provides an example of a dualistic view regarding the number of categories of substance in that it hold that both mental and physical substance exist. Dualisms with regard to causation appear in many ontological frameworks. For instance, in Chinese philosophy the concept of yin and yang—complementary interacting forces represents a dualism of forces.[29]

Monism: According to Wallis, monism refers to the supposition within an ontological framework of a single fundamental category to fill a specific role. Thus, both monistic idealism and monistic physicalism provide examples of monistic views regarding the number of categories of substance. Unified field theory would constitute a monistic view regarding the number of categories of force in physics. Unified field theory seeks to replace the current four fundamental forces with a single force.[30]

Monistic Idealism (Idealism): Monistic idealism holds that mental substance constitutes the only entity in the universe. Berkeley stands out as one of the most influential monistic idealists. Berkeley holds that all mental and physical phenomena consist of nothing but ideas in minds.[31, 32]

Monistic Physicalism (Physicalism or Materialism): Monistic Physicalism holds that physical substance constitutes the only entity in the universe. Therefore, monistic physicalists hold that all phenomena—both physical and mental phenomena—result from modifications or permutations of physical substance. The Presocratic philosophers Leucippus[33] (and his pupil Democritus[34] (460-370 BCE) founded one school of monistic physicalism--atomism.[35] Greek atomists like Democritus hold that the universe consists of atoms and the void.

Oppositional Dualism: According to Wallis oppositional dualism refers to the supposition within an ontological framework of two fundamental categories to fill a specific role where the framework assigns opposite or fundamentally different properties to each category. Plato's dichotomy between the sensible and the intelligible introduces a dualism of ontological kinds sharing no essential properties—an oppositional dualism. For Plato the sensible realm consists of entities that are changeable, divisible, and capable of manifesting contradictory properties. In contrast, the intelligible realm consists of immutable, indivisible entities that never manifest contradictory properties.

Oppositional Substance Dualism: According to Wallis oppositional substance dualism to refers to those substance dualisms that assign opposite or fundamentally different properties to each kind of substance. Thus, Descartes substance dualism counts as an instance oppositional substance dualism in that Descartes defines mental and physical substance in terms of opposing properties. For example, physical substance is divisible while mental substance is not divisible.

Pluralism: According to Wallis, pluralism refers to the supposition within an ontological framework of two or more fundamental categories to fill a specific role. For example, the current four fundamental forces in physics represents a pluralistic view regarding the number of categories of force in that physicists hold that the four fundamental forces, gravitation, electromagnetism, strong nuclear force, and weak nuclear force, constitute the set of forces necessary to explain physical phenomena. Similarly, Anaxagoras[1] (500-428 BCE) of Clazomenae (an area in Turkey in Asia Minor) appears as the ultimate substance pluralist, holding that all types of materials—from milk to gold—constitute distinct eternally existing substances with their respective characteristics.[2-4] Empedocles[5](490-430 BCE) of Agrigentum (now known as the city of Agrigento in Sicily) appears likewise to adopt a pluralism. Empedocles posits the existence of the basic four elements (earth, air, fire, and water) together with two forces, love for combining and strife for separating these elements to create other materials. [2, 6]

Substance Dualism: Substance dualism posits the existence of two fundamental kinds of substance-- mental substance and physical substance. In general, substance dualists assert the existence of two fundamental kinds of substances on the grounds that a single substance cannot explain both mental and physical phenomenon. Thus, substance dualists claim that all mental phenomena result from modifications or permutations of mental substance. All physical phenomenon, in contrast, result from modifications or permutations of physical substance. Importantly, substance dualism holds that mental substance and physical substance are irreducible to one another. Rene Descartes probably stands out as the most famous substance dualist.[36]

Substance Monism: Substance monism holds that only one type of substance exists; there is only one kind of entity in the universe. According to substance monism all of the universe's phenomena-- both mental and physical phenomena--result from some sort of modification or permutation of a single kind of entity. The two most common versions of substance monism are monistic physicalism (also called physicalism or materialism) and monistic idealism (also called idealism).

The domain hypothesis: According to Wallis the domain hypothesis refers to the theoretical supposition that the diverse set of phenomena form a common set of interrelated phenomena (i.e., a domain). In this chapter Wallis suggests that the development of the Greek concept of the soul ultimately leads thinkers to formulate a

domain hypothesis with regard to mental processes and properties. That is, theorists ultimately come to suppose that mental processes and properties form a common, interrelated set of phenomena—a domain.

The Common Locus Hypothesis: According to Wallis theorists forward the common locus hypothesis whenever they come to suppose that a set of interrelated processes and properties have a common locus—that there is a single thing that has the properties and where the processes occur. In this chapter Wallis suggests that the development of the Greek concept of the soul ultimately leads thinkers to formulate a common locus hypothesis with regard to mental properties and processes. That is, theorists ultimately come to suppose that there is a single entity—the mind—that has mental properties and in which mental processes occur.

The Mental Distillation Hypothesis: The process of property and process accretion through which theorists come to identify the contemporary mental processes and properties with the soul also infuses the notion of the soul with other, non-mental properties. Once Greek thinkers have come to accrete the set of contemporary mental properties and processes to the soul, they must also disentangle other properties and processes from that entity. Wallis calls this the mental distillation hypothesis.

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