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Beliefs about Seeing:

Optics and Moral Technologies in Early China

If men had been born blind, philosophy would be
more perfect, because it would lack many false as-
sumptions that have been taken
from the sense of sight.

Galileo, 1610

Therefore, the kings of ancient times wore a crown
whose pearl fringe obscured their sight... The screen
that cut the Son of Heaven off from the outside was
designed to protect his own faculties of insight.

Huainanzi 9

Therefore the sage sees the transformations and so
watches for their nascent distinguish-
ing marks. 故聖人見化以觀其徵

Huainanzi 13

Modern philosophy is steeped in the conceptual apparatus of reflexivity,¹ but this was less true of the early thinkers during the classical era (323 BC–316 AD), in Greece or in the territory we now call China.² (“Reflexivity” implies more than “introspection,” the mind’s purported ability to reflect upon itself in an arena dubbed the Cartesian theater; it denotes a deep and abiding preoccupation with

¹ Shadi Bartsch, *The Mirror of the Self: Sexuality, Self-Knowledge, and the Gaze in Early Modern Europe* (Chicago: U. Chicago, 2006), p. 17. Cf. Richard Rorty, *Philosophy and the Mirror of Nature* (Princeton: Princeton U.P., 1979), passim. See Lilian Balensiefen, *Die Bedeutung des Spiegelbildes also ikonographisches Motiv in der antiken Kunst* (Tübingen: Ernst Wasmuth, 1990); and Andrew Stewart, “Reflections,” in Natalie Boymel Kampen, ed., with Bettina Bergmann et al., *Sexuality in Ancient Art* (Cambridge: Cambridge U.P., 1996), pp. 136–54, on mirrors in ancient art; and Willard McCarty, “The Shape of the Mirror: Metaphorical Catoptics in Classical Literature,” *Arethusa* 22 (1989), pp. 161–95; Frontisi-Ducroux, Françoise and Jean-Paul Vernant, *Dans l’œil du miroir* (Paris: Odile-Jacob, 1997), on mirrors in Greece. For China, see Kenneth E. Brashier, “Longevity like Metal and Stone: The Role of the Mirror in Han Burials,” *TP* 81.4–5 (1995), pp. 201–29; and Eugene Yuejin Wang, “Mirror, Death, and Rhetoric: Reading Later Han Chinese Bronze Artifacts,” *Art Bulletin* 76.3 (Sept., 1993), pp. 511–34.

² For this essay, I define the classical era in China as from 323 BC, the date by which each of the leading Zhanguo powers had named themselves “kings,” thereby signifying their inten-

the psychology of the self.)³ As Socrates decides with his interlocutor Critias,⁴ there can be no kind of seeing that would be “seeing of itself.”⁵ During the classical eras, at the same time, ethics and optics invariably went hand-in-hand, as suggested by very common words like “reflection,” “vision,” “introspection,” and “Enlightenment.” Seeing was often privileged over other types of perception, presumably in part because the power of sight enjoys a wider potential range than that of touch, smell, or hearing and in part because sight purportedly involved touch as well; some also felt the eye to be especially “prone to movement.”⁶ Moreover, people are generally inclined to trust what they see over perceptions involving the other senses.⁷ The primacy of sight evidently insures that beliefs about seeing have often shaped how thinkers visualize the world at large or conceive the act of thinking.

This essay reviews the current literature on modern neuroscience, as well as early Greek and Mohist optics, before turning its attention to the beliefs about seeing registered in early philosophical texts in China, especially the *Zhuangzi*. The final section in the essay focuses on the *Zhuangzi*, not because that text proposes a distinctive theory of perception and misperception, but rather because it offers particularly elegant approaches to theories found in a great many pieces of classical literature, received and excavated. A particular focus on the *Zhuangzi* seems doubly justified in an essay dedicated to my teacher, Nathan Sivin, since it was Sivin who introduced me to that text’s soaring vision.

tion to take over from the moribund Zhou, and to 316 AD, the date of the conquest of the North China Plain following the fall of Luoyang and Chang’an, after which come huge changes in society and thought. While Mozi purportedly lived and died a century before 323 BC, the Mohist classic certainly dates to a time within the classical era, as defined here. Since “China” is a modern construct – the Central States (also Zhongguo 中國) being a group of polities along the Yellow River valley – this essay uses “China” only to refer to the geographic region that corresponds roughly to the present-day People’s Republic of China, minus the so-called Autonomous Regions. “Chinese” it saves for the written language and writers using it.

³ As Bartsch, *Mirror*, reveals, the classical thinkers in Greece expressed almost no concern with the psychological, being preoccupied rather with the (male) person as social agent (pp. 52–53), despite talk of “the itself itself” (*auto to auto*, in *Alcibiades* 120b, 130c–d, usually [mis]translated as “the self itself”). The early thinkers writing in classical Chinese had an acute sense of different personalities, and they discussed examining their own consciences, as the famous lines from *Analects* IV/17, XI/4 about *neisheng* 內省 suggest; cf. *ibid.*, 10/19. But Zhuangzi and many other thinkers were unwilling to speculate about the possible relations between the *xin* 心 as “ruler” (*zhu* 主) of the corporeal person and the body’s sensory organs and receptors.

⁴ *Critias* 167c–d.

⁵ Socrates’ belief that knowledge must have a subject-matter distinct from itself is echoed by Aristotle in *De Anima* 445b1–449b3.

⁶ Plutarch, *Quaest. Conv.* 5.7. As David C. Lindberg, *Theories of Vision from Al-Kindi to Kepler* (Chicago: U. Chicago P., 1976), p. 3, says, “Vision, then, is reduced to a species of touch.”

⁷ David Linden, *The Accidental Mind: How Brain Evolution Has Given Us Love, Memory, Dreams, and God* (Cambridge, Mass.: Belknap, 2007), p. 82.

CURRENT SCIENTIFIC THEORIES ABOUT SEEING

Today's neuroscientists are quick to challenge what Daniel Dennett has called the "Cartesian theater" – Dennett's expression for the strong subjective experience that most people seem to share: that thinking consists of forming mental imagery – in effect constructing one or more "pictures in our head" – so that the brain serves as a sort of stage on which to view representations of aspects of reality.⁸ Of course, the "Cartesian theater" represents a classic case of the "intentional fallacy," insofar as it attributes to a mental state the properties of the world outside. Nonetheless, people tend to believe that any careful consideration of a past or future event entails "seeing it in their mind's eye," that is, creating an inner replica of the world that we believe we are observing, visualizing, or thinking about. Several recent studies clearly discredit the idea that vision helps in any way to construct extended replicas of scenes outside of our bodies. Despite our "illusions about the autonomy of the imagined scene," a considerable body of evidence shows that humans interpret and shape discrete visions even before they become aware of a perception of sight or insight, and that this same interpretive

⁸ The Cartesian theater is also known as the "picture theory" of mental imagery. Descartes believed that this sense of consciousness is the most undeniable fact of our existence: *cogito ergo sum*. "The Hard Problem" in current neuroscience, says the philosopher David Chalmers, is how neural computation relates to the first-person, subjective, and conscious experience that we are engaging in the process of thinking in our heads. This problem is intractable, if only because (as Louis Armstrong once remarked of jazz) "When you got to ask what it is, you never get to know." In other words, this subjective sense may well not be amenable to scientific testing and investigation. Ludwig Wittgenstein, *Remarks on the Philosophy of Psychology* (Chicago: U. Chicago P., 1980), passim, argued that the rootedness of consciousness in the brain tissue lies in an "unbridgeable gulf" between the brain and mind.

The philosopher Colin McGinn has theorized that our "vertigo" when pondering the relationship of mind to brain is itself a product of evolution, which has limited memory and visualization capacities; Linden, *Accidental Mind*, agrees. By contrast, Antonio Damasio, "A Story We Tell Ourselves," *Time Magazine*, Special Issue on Mind & Body (Jan. 29, 2007), p. 66, insists that "All the natural history required to understand consciousness is now readily available in evolutionary biology and psychology." Damasio equates the establishment of neural networks composed of hundreds of billions of neurons that communicate with each other with "the emergence of a basic self." Sharon Begley, "How the Brain Rewires Itself," *Time Magazine*, Special Issue on Mind & Body (Jan. 29 2007), pp. 72–79; and Begley, *Train Your Mind; Change Your Brain* (New York: Ballantine Books, 2007), show meanwhile that these neural networks can be rewired, even in old age. NB: our neural pathways "decide" to take an action (say, picking up a pencil) before we are conscious of deciding to take that very action (see Henry Rosemont, Jr., "Who Chooses?," in *Chinese Texts and Philosophical Contexts: Essays in Honor of A.C. Graham* [La Salle: Open Court, 1999], pp. 227–63).

Intriguing are the findings of the psychologist Dan Wegner, which show that people experience the sense that they are authors of certain actions (in his experiment, the waving of arms) so long as that is what they see in mirrors; never mind that their bodies do not initiate those actions. (Wegner's experiments had other persons placed behind the experimental subjects waving their arms in careful ways that were "read" by the subjects as belonging to themselves, as reported in Bernard Baars, *In the Theater of Consciousness: The Workspace of the Mind* [New York: Oxford U.P., 1997].)

process goes on whether we are actually seeing aspects of the world outside or in the “mind’s eye.”

The fundamental independence of imagery from vision is indisputable. Blind people show virtually all the psycho-physical phenomena associated with mental imagery. They may even “see” shapes and textures (like sighted people). Classical thinkers in China noted an extraordinary sensitivity in the blind, which allows blind musicians, for instance, “not to miss a string on a lute.”⁹ Today we also know that people experience color because it is useful to do it – not because it is a property that truly inheres in objects existing in the world around us.¹⁰ Vision may have evolved to help humans keep track of where to locate information about phenomenal existence, since then the mind need not encode in memory everything that is visible. If this is so, vision serves as an extension of or alternative to the memory bank.¹¹ For such reasons, Antonio Damasio, Director of the Brain and Creativity Institute at USC, would have us radically alter the “Cartesian Theater” analogy, so as to make the observer simultaneously part of the stage play and part of the audience; thus in Damasio’s theater, the single person becomes both the subject and object of vision, both the producer and controller of the mental images. At least two aspects of Damasio’s understanding will prove to be germane to the following discussion: first, that something in the mind or brain itself – and not the eye – performs the role of the observing self;¹² and second, that visions of the outside world – and quite possibly inner visions, as well – generate symbolic representations or codes, rather than miniature displays of the world of memory and experience. Regarding the second point, it is noteworthy

⁹ Zenon W. Pylyshyn, *Seeing and Visualizing: It’s Not What You Think* (Cambridge, Mass.: MIT P., 2003; rpt. 2006), p. 400. For blind men who “do not miss a string 不失一弦” when playing, see *Huainanzi honglie jijie* 淮南子鴻烈集解, annot. Liu Wendian 劉文典 (Shanghai: Shangwu yinshuguan, 1923; rpt. Taiwan: Shangwu, 1974), j. 19 (“Xiuwu”), p. 12a.

¹⁰ See anon., “A Survey of the Brain,” *The Economist* (Dec. 23, 2006), pp. 5–12. The retina has cells that are particularly sensitive to three different wavelengths of light, and the brain weaves the signals from them together to create the effect we call color.

¹¹ J. K. O’Regan, “Solving the ‘Real’ Mysteries of Visual Perception: the World as an Outside Memory,” *Canadian Journal of Psychology* 46 (1992), pp. 461–88; D.H. Ballard et al., “Deictic Codes for the Embodiment of Cognition,” *Behavioral and Brain Sciences* 20.4 (1997), pp. 723–67.

¹² Decisions that are simple (when to move a finger) physically start about 3/10 of a second before an individual is conscious of the decision to undertake a particular activity. Something in the brain seems to be observing the decision, rather than deciding it. Long before this gap was calculated, Howard Margolis, *Patterns, Thinking, and Cognition* (Chicago: U. Chicago P., 1987), and Rosemont, “Who Chooses?,” p. 242, had considered the implications of the probability that “conscious judgments probably do always *follow*, never determine, choices.” For more on the question of free will, see Dennis Overbye, *The New York Times*, Jan. 2, 2007, “Free Will: Now You Have It, Now You Don’t,” Science Section (F), p. 1.

that people can imagine all sorts of impossible things. Pigs can and do fly and, still more amazingly, green ideas may sleep furiously.¹³

The equipment we call “the human senses” encodes and stores in memory surprisingly little of any given visual scene, unless we explicitly attend to certain items in our field of vision, directing our gaze to them.¹⁴ As the writer Italo Calvino observes, “Rarely does the eye light on a thing, and then only when it has recognized that thing as the sign of another thing. ... [Things] are not valuable in themselves but as signs of other things.”¹⁵ To record features of a given scene, the mind requires labeling “tags” to be attached to each feature. If such tags are not attached to a particular sight early on, then aspects of the sight may not be recorded at all.¹⁶ As Wittgenstein remarks, “what something looks like” has a great deal to do with “what we believe that something to

¹³ The latter image – minus the word “colourless” – evokes Noam Chomsky’s famous example of a grammatically correct but semantically meaningless statement. Chomsky’s critics claimed the sentence was ungrammatical and he had distinguished too sharply between the realms of syntax and semantics, but I am not prepared to digress on this. “Pigs can fly” recalls Hume’s famous “streets paved with gold (see his *Treatise*), i.e., combining “impressions” to form “ideas.”

¹⁴ The visual angle of the retina and the foveal attention [i.e., focal attention] are constrained, the latter by the brain’s cognitive architecture. This notwithstanding too much information comes to the mind to be processed in nano-seconds. Therefore Pylyshyn, *Seeing and Visualizing*, chap. 5, esp. pp. 200–8, posits the existence of a “visual index” within the brain (i.e., a mechanism that precedes the allocation of focal attention, allowing the cognitive system to pick out a small number of visual objects to determine certain of their properties, so as to *bind* parts of representations to these objects). “The task of imagining something unfolding in your mind’s eye is a special task” because it requires marshalling different “tagged” or “labeled” features of the visual situation not in real time, and then playing them through, Pylyshyn argues. Put another way, “one refers to an object not as something ... located at certain coordinates” but as “the individual [object] one has selected for certain reasons” (p. 208). At present, Pylyshyn can only speculate about the existence of such an index. It is clear, however, that people who become mathematicians and musicians tend to be able to process massive amounts of encoded information more quickly than those in other professions. See Joe Devlin, musician, talking in the movie “Wordplay.”

¹⁵ Italo Calvino, *Invisible Cities*, trans. William Weaver (New York: Harcourt, Inc., 1972), p. 13, with text rearranged. According to Michael D. Lemonick, “The Flavor of Memories,” *Time Magazine*, Special Issue on Mind & Body (Jan. 29 2007), pp. 102–4, citing the neuroscientist James McGaugh (UC-Irvine), the main “purpose of memory is to predict the future.” Hence the special sector in the brain devoted entirely to memory. Memorable events or people induce extraordinary activity in the brain’s amygdala inside the brain’s medial temporal lobes, which then releases norepinephrine, which kicks the body’s autonomic nervous system into autodrive, and sends signals to the rest of the brain, making for especially robust memories. An Israeli study cited in *ibid.*, p. 104, showed that witnessing memorable events continued to increase the hormonal release; another study suggests that playing beloved music triggers the same hormonal release. See Clive Thompson, “Music of the Hemispheres: Are Our Brains Wired for Sound?” *The New York Times*, December 31, 2006, section 2, “Arts and Leisure,” pp. 1, 26.

¹⁶ One common example: having a clear image of the person does not mean that the image cannot be missing visual data (as when we cannot say whether the person “seen” is wearing glasses).

be.”¹⁷ The coherent narratives that we tell ourselves about phenomenal existence – especially those narratives in which the self figures largely – go a long way toward predetermining choices of focus (that is, what the eye alights upon). Put another way, “value and need” are “organizing factors in perception.”¹⁸ This makes it all the more crucial that we consider the taxonomies (*lei* 類 in Chinese) employed in deciding how things appear in any given society.

Some scientists stress the fundamental flaws in the basic perceptual equipment given to humans.¹⁹ To give but one example, people do not retain a full picture of what happens before their very eyes, because they would otherwise experience data overload, given the billions of impressions that come flooding into the senses every hour. The human sensory equipment has to work very quickly to construct complex images from their constituent parts (figure 1, appended).²⁰ Then, too, the human brain is not equipped to superimpose retinal information culled from quick successive glances (“saccades” or “eye skips”), with the result that humans often fail to notice and map major changes in sequentially presented pictures. Anatomical specializations within the brain itself – discrete processing centers²¹ – mean that any single act of seeing requires exceedingly complex acts of coordination within and between different parts of the brain to compose a single coherent picture from disparate reactions to multiple stimuli. For instance, visual percep-

¹⁷ Wittgenstein, *Philosophy of Psychology*, #1013. E.J. Gibson, *An Odyssey in Learning and Perception* (Cambridge, Mass.: MIT P., 1991), demonstrates that experience can alter how people apprehend the visual world.

¹⁸ Jerome S. Bruner, “On Perceptual Readiness,” *Psychological Review* 64 (1957), pp. 123–52, confirmed this hypothesis.

¹⁹ Linden, *Accidental Mind*, p. 6, calls the mind or brain “inefficient, inelegant, and unfathomable” – “an ill-assorted collection of poorly matching parts, forming a distressing whole.”

²⁰ For example, the retina receives a limited, non-stable set of data in 2-D, but the person observing seems to see a 3-D layout of surfaces and objects and shapes in a wide panorama of 180 or more degrees. Furthermore, the visual representation is built up over time as various properties are noticed in quick successive glances. Interestingly enough, visual forms can be discerned even when there are no literal forms on the retina (Pylyshyn, *Seeing and Visualizing*, chap. 1). Strictly defined, “vision” [i.e., retinal perception] depends very little on how the system was wired by evolution and biology; on chemical and physical principles; and on incoming patterns of light. Interestingly enough, the ability to recall images is either uncorrelated or negatively correlated with the vividness of the experience. See G. H. Berger and S. C. Gaunitz, “Self-rated Imagery and Vividness of Task Pictures in Relation to Visual Memory,” *British Journal of Psychology* 68.3 (1977), pp. 283–88. P. A. Chara and D. A. Hamm, “An Inquiry into the Construct Validity of the Vividness of Visual Imagery Questionnaire,” *Perceptual and Motor Skills* 69.1 (1989), pp. 127–36, although the confidence level of reports correlates well with vividness, as pointed out in S. J. McKelvie, “The Vividness of Visual Imagery Questionnaire as a Predictor of Facial Recognition Memory Performance,” *British Journal of Psychology* 85.1 (1994), 93–104.

²¹ So far, these specializations have been located in the cerebrum, cerebellum, brain stem, smaller limbic system, and basal ganglia.

tions of a single human or animal form on the move register initially in several sectors of the brain. In a fashion analogous to a human pipe organ, the neural impressions transmitted and received then merge in nanoseconds to create a sense of a single harmonious image (figure 2; all figures appended).²² Furthermore, “long-term memory” seems to be composed of at least three sets of functions, each of which is located or reflected in one or more parts of the brain: autobiographical memory; “semantic” memory generalizing experience; and a procedural bodily memory that allows us, for example, to know how to perform a physical task, such as riding a bike or typing a paper.²³ Despite the complexity of coordinating messages of different types traveling along neural pathways between different sites within the brain, humans are seldom conscious of multiple disjunctions in their visions. Evidently, the human brain experiences very little trouble when “filling in” the gaps in missing patterns. Nor do these gaps preclude a person from determining what action to take toward an object, person, or event she thinks she has been seeing, even if the failure to see things “whole” makes people remarkably poor observers of what is happening not only inside the self, but also in the world at large.

By current theory, the content of our visions, whether those focus on the outside world or what is in the mind’s eye, invariably is the dynamic product of: a. what we intend the mental image to show; b. “tacit knowledge” or “memory” (meaning, what we think we know about things in the world through experience);²⁴ and c. the constraints in the particular physical mechanisms or equipment that spark mental imagery in the eye and the brain.²⁵ The need for established patterns to be employed in organizing the “tacit knowledge” or “memory” inclines a person toward a “mechanization” or “routinization” of experiential knowledge; hence the inclination to adopt habitual ways of solving

²² The metaphor of the human pipe organ comes from Michael Gazzaniga, Director of the SAGE Center for the Study of Mind at the University of California at Santa Barbara.

²³ See the theory of Eleanor Maguire (Institute of Neuology, London), on long-term memory (as opposed to short). Nancy Kanwisher (McGovern Institute for Brain Research, MIT), believes that certain parts of the cortex are designed to extract the essential properties from various things (e.g., the essential property that makes an object a table rather than a pile of firewood). Vision tends to be associated with “higher emotions” and also with a “theory of mind” perhaps because of its involvement with the frontal lobes. Many of these issues are taken up in Linden, *Accidental Mind*, chap. 5.

²⁴ “Knowledge can be organized and accessed in many different ways – or “not accessed at all, if it seems like more work than it is worth” (Pylyshyn, *Seeing and Visualizing*, pp. 299, 313–16).

²⁵ Regarding (c), many cognitive scientists believe that there is a special *lingua mentis* (“Language of Thought” or LOT) akin to the “universal grammar” proposed by Chomsky and Steven Pinker (Harvard).

certain kinds of problems.²⁶ (That explains why people who have gotten stuck with one view of an object's function can more easily resolve an issue relating to that view as soon as they view the object in a truly different way.)

Since the classical era, careful observers pondering the relations between thinking, seeing, and visualizing have detected certain constraints of the eyes and brain. An awareness of optical illusions is hardly new, even if informed speculation about the origins of such constraints had to await the invention of the modern EMI. After all, if someone removes and reinserts an object every time a subject blinks – creating the effect of flashing two pictures in rapid sequence – any subject is hard pressed to notice the discrete changes, even if such changes may have momentous consequences for the person's life.²⁷ A very low-tech experiment induces this sense of binocular rivalry: look through a paper tube at a white wall with your right eye; hold your left hand in front of your left eye. After a few seconds, a white hole should appear and then disappear in your hand. Of particular interest to ethicists (past and present), therefore, is the relation between what we *intend* and what we *know*, since the brain structure – or cognitive architecture – of able-bodied humans remains pretty much a constant, for all practical purposes, aside from mental defects from birth and crippling accidents. (“Cognitive architecture” is the newer model for the functions that past generations assigned to the “ghost in the machine”; the phrase implies that certain thought processes are as unconscious as the muscle contractions that allow a person to breath.)²⁸

²⁶ Zhuangzi abhorred this routinization (see below). NB: experiments show that certain visual cues in the “visual system” operate regardless of whether we are looking at a real object or a visual representation of the object.

²⁷ Optical illusions typically result when two characteristic patterns of viewing images or two foci of attention contradict one another and so collide, making one's perception of the images unstable. Figures can even seem to reverse when there are two plausible interpretations of a particular image and the mind fails to settle upon one. Evidently, the system cannot handle two tasks at once that require the same conceptual vocabulary; it lacks enough attention to go around, in the formulation of Pylyshyn, *Seeing and Visualizing*, p. 337. Some dilemmas, of course, cannot be resolved via words or mental images. Take the following case: if Person 1 leaves the room, you should open the door. But if Person 2 opens the door, you must be near the door. These are apparently unrelated beliefs because (1) what triggers them [the beliefs] may not be the same; (2) it is hard to establish whether or not a pre-existing relation will change when a given action is performed; and (3) there is also the problem of interpreting the resulting image of what happens, since an intermediate condition can change the relationships between Person 1 and 2, not to mention the relation of the viewer to the door.

²⁸ The distinction between conscious and unconscious thoughts is designated by David Chalmers the “Easy Problem” amenable to analysis by scientists using present-day tools. See “Survey.” All species that can recognize themselves in the mirror have abnormally large cerebral cortexes relative to the rest of the brain.

Impressive gains in neuroscientific research within the last decade make it seem less and less likely that there is a single executive “I” that sits in the control room of our brains. Nonetheless, some of the best neuroscientists continue to posit the existence of a single location in the brain – as yet unidentified – that sorts diffuse data about sights along neural pathways, deciding what to focus upon and respond to. Like so many of us, these scientists, even if they accept the fact that humans cannot possibly see the form in which their thoughts are encoded or recognize the nature of the thinking process itself, continue to presume that some process of introspection (that is, seeing what we are thinking about) occurs. To date, however, cognitive science says remarkably little about the subjective mode of operation that happens when we think we are “seeing” an episode. After all, seeing in the mind’s eye is tied up with deeply mysterious questions of consciousness and, by implication, to causes that may not be entirely physical. At the same time, no astute student of human nature has been able to overlook the propensity of humans to seriously misjudge the social relations they engage in, not to mention the consequences of those relations. Indeed, humans are notoriously likely to fail in that most fundamental of social tasks, accurately seeing and judging others (*zhi ren* 知人), notwithstanding the insistence by many that human behavior creates “human portents” (*ren yao* 人妖) more easily read than any signs in the heavens.²⁹

As it may well be a long time before the current theories in neuroscience are proven or refined, let us now turn to the optics of the early Mohists and the early Greeks, to see what they believed about seeing.

ON OPTICS IN CLASSICAL GREECE

Two widely acclaimed works, the first by Gérard Simon and the second by Shadi Bartsch, have sought to clarify relations between optics, views of the body, and the form of representations in classical Greece, while a third, that by Lindberg, treats the relation of seeing to vision.³⁰ By these three accounts, none of the major schools of Greek thinkers – with the possible exception of one thinker in one school³¹

²⁹ See, e.g., *Zuozhuan*, Duke Zhuang 14, *fu* 1, cited according to *Chunqiu jingzhuan yinde* 春秋經傳引得, Harvard-Yenching Sinological Institute Series 30 (Beiping: Harvard-Yenching Institute, 1937); and *Xunzi ji jie* 荀子集解, comp. Wang Xianqian 王先謙 (Beijing: Zhonghua shuju, 1988; hereafter, *Xunzi*), j. 17, p. 436. Cf. Kidder Smith, “*Zhouyi* Interpretation from Accounts in the *Zuozhuan*,” *HJAS* 49.2 (Dec., 1989), pp. 421–63.

³⁰ See Gérard Simon, *Archéologie de la vision: L’optique, le corps, la peinture* (Paris: Seuil, 2003); Bartsch, *Mirror*; and Lindberg, *Theories of Vision*.

³¹ Simon considers Democritus, the Epicureans, the Pythagoreans, the Platonists, and the Stoics, noting that they share the following presumptions: (1) the central location of the earth;

– imagined the retinal image or the brain substantially participating in the manipulation and interpretation of perceptual data reaching the eye. Instead, the early Greeks shared a “common premise that all sensation is caused by direct contact” between the organ of sense and a thin “material effluence” or film (*eidola* or *simulacra*, images or simulations) transmitted from the visible object to the eye; this contact, in turn, created a particular sight. The so-called “extramission” and “intromission” theories (figure 3) emphasized, respectively, either the emission of visual rays from a given object to the eyes or emanations from the eyes to the object. Galen, the most famous early medical writer in the second century AD, put it this way: “A body that is seen does one of two things: either it sends something from itself to us and thereby gives an indication of its peculiar character, or... it waits for some sensory power to come to it from us.”³² By some influential theories, the stream of material light or fire that issues forth from the observer’s eye coalesces with sunlight, since like seeks like, forming a material intermediary between the visible object and the eye; the encounter between this “single homogeneous body” formed by the two sorts of light and emanations from the object itself then set off motions that travel to the soul (possibly via fine channels that pierce through the round pupils of the eye or vibrating optical nerves), where the third impact creates the sensation dubbed “seeing.”³³ “The eye becomes filled with vision and now sees, and becomes not vision, but a seeing eye.”³⁴

(2) the opposition of heavy and light; (3) the stopping of a violent movement without momentum; (4) the absence of the void. Simon identifies a single treatise on optics attributed to Aristotle as the one possible exception to the general picture summarized here. However, Simon notes that the rest of the writings attributed to Aristotle do not seem cognizant of Aristotle’s conclusions in the optical treatise ascribed to him. So, either the attribution is incorrect or Aristotle’s thoughts on that subject were never systematically incorporated into the rest of his works. Since Alexander Shute in 1888 demonstrated that what we call “Aristotle” is a collection of writings produced long after the thinker’s death, the optical treatise ascribed to Aristotle may represent a much later theory. See Scott L. Montgomery, *Science in Translation: Movements of Knowledge through Cultures and Time* (Chicago: U. Chicago P., 2000), chap. 1.

³² *De placitiis*, 5, no. 4, 8.5.

³³ Lindberg, *Theories of Vision*, pp. 4–5, citing Empedocles and Plato’s *Timaeus*. The Stoics speak of optical pneuma flowing from a seat of consciousness (*hegemonikon*) to the eye, exciting the air adjacent to the eye. See below.

³⁴ *Theaetetus* 156d–e, after Francis M. Cornford, *Plato’s Theory of Knowledge: The Theaetetus and the Sophist of Plato* (London: Routledge & Kegan Paul Ltd., 1935), p. 47. Aristotle’s focus on this medium between the observer and the visible object involves him in discussions of transparency, light, and color that define light as that state of a transparent medium in which transparency is actualized. Aristotle thinks the eyes primarily composed of water; this accounts for both their participation in the transparency and their receptivity to light and color. He posits a continuous medium, the transparent, extending from the visible object all the way to the interior of the eye, which then “acts upon the sense organ” which is “within.” See Lindberg, *Theories of Vision*, pp. 8–9.

In the major Greek theories, the visual rays, conceived as “physical agents of sight,” were streams of tiny particles moving in straight lines to and from a visual cone, whose origin lay in a single point within the eye or on its surface and whose widest part was defined by the limits of what the eye could see in a given situation.³⁵ These rays somehow conveyed vectors of sense and sensibility in their travels; and, by a few theories, daylight or air itself also was endowed with sensory power. The classical Greek optical theories, as Bartsch and Lindberg emphasize,³⁶ therefore conceived visual perception as a sort of “tactile” contact between the perceiver and the object of perception. Because vision partook, as it were, of the two powerful senses of touch and sight, vision was widely held to be the sharpest of the bodily senses.³⁷ One of the few disputes in the optical theories of classical Greece was whether the simulacra actually penetrated the eye or were stopped at its surface from going further. As the pupil of the eye was known to be made of a watery substance, most saw it as the main medium receiving the simulacra, which were thought to proceed with fewer impediments through liquids and air. A second point of disagreement was whether the air itself affected the process of seeing in any way, for example, by compressing parts of the efflux.³⁸

In Euclid (or the manuscripts attributed to him), two different terms designate these visual rays: (1) *actines* (sing. *aktis*), the “firey” rays that confer light and color upon an object, rendering it visible to anyone who can see (but not to the blind); and (2) *opseis* (sing: *opsis*), used to describe all the simultaneous lines of sight that a person commands when viewing an object before him.³⁹ The Platonists and Ptolemy, in particular, stressed that what we view as an “image” has no substantial

³⁵ Euclid postulates sentient and insentient regions within the cone of visual rays. See Lindberg, *Theories of Vision*, p. 13, for this and for rays as “physical agents.”

³⁶ Bartsch, *Mirror*, esp. chap. 1; Lindberg, *Theories of Vision*, p. 2. While rejecting some aspects of Plato’s theories, Aristotle adopts Plato’s talk of an optical medium as the connecting link between the object seen and the seer.

³⁷ According to Kenneth DeWoskin, *A Song for One or Two: Music and the Concept of Art in Early China* (Ann Arbor: Center for Chinese Studies, University of Michigan, 1982), early “Western” cultures (including the Buddhists) privileged seeing among the senses while the Chinese privileged hearing. Categorized under “hearing,” however, are records of the past and traditions relating to community, which may have less to do with actual hearing than with age-old modes of cultural transmission. Note the philosophical importance of light or clarity (*ming* 明) and the light-giving sources, such as the sun, immense topics deserving separate treatments.

³⁸ The Greek and Hellenist thinkers reviewed in this section disagreed about whether the visual rays must be discrete or continuous.

³⁹ As noted above, modern neuroscience suggests that these are by no means simultaneous lines of sight. Even a single object is usually “seen” and reconstructed more or less accurately through successive glances, and the broader and more complex the sight, the more discrete glances are typically required to compose a coherent object or scene.

physical reality of its own, since it represents “something sent,” a quasi-material projection of the person or the object that is inherently of lower value.⁴⁰ Likewise, colour is deemed to be merely an effect produced either by the direct impact of the visual rays’ passage through various milieu or as a by-product of the collision of visual rays with a given object.

One notable feature of the Greek optical theories is their failure to disentangle the physical and mental contributions to seeing, and their related tendency to downplay or even dismiss the psychological factors that influence each process of seeing. Theorists in classical Greece had no theoretical way to distinguish perspectives from the laws of vision.⁴¹ By Simon’s account, the early Greeks devoted so little time to interiority because their theories focused instead on the continuous flow between the visible object with the perception of that object, at times even conflating the object with the perceptions of it, just like a person conflating her image reflected in a pan of water or a mirror with her own “true self.” Furthermore, after Euclid (ca. 300 BC), ever greater weight was put on the mathematical theory of vision, excluding “all but the most incidental references to those aspects of the visual process not reducible to geometry.”⁴² In effect, optical problems became geometrical problems, so that, for example, greater clarity of vision was thought to be simply the result of seeing objects under more angles.⁴³ Similarly, poor vision was attributed, as with Ptolemy (fl. 127–48), to transfers of energy diminished by the successive impacts occasioned during reflection and refraction. Accordingly, the extant Greek optical theories discussed at great length the following three problems:

1. malformations in the eye (most attributable to illnesses and old age) that were believed to impede, divert, or muddle straight-line reflections or refractions;
2. mysterious imbalances in the elements composing what was seen that precluded accurate reception of the visual rays by the eye;⁴⁴ and
3. dioptics (meaning, changing the length and/or angle of rays between

⁴⁰ Hence the traditional higher value placed on an original versus a copy, as noted by Arnaldo Momigliano, “Ancient History and the Antiquarian,” *Journal of the Warburg and Courtauld Institutes* 13.3–4 (1950), pp. 285–315. The Epicureans imagined something like atoms making their way to the eye as a simulacrum which would effect contact with the eye, but even with the Epicureans, the simulacra have no other function but to effect a kind of transfer of a sensory image between objects and eyes (pp. 40–41).

⁴¹ Simon, *Archéologie de la vision*, p. 24.

⁴² Lindberg, *Theories of Vision*, p. 12.

⁴³ The seventh and final postulate of Euclid’s *Optica* says, “Things seen under more angles are seen more clearly.”

⁴⁴ Both 1 and 2 implied imperfection(s), either in the object or in the eye itself.

eye and object), so as to explore all possible deformations of the images perceived.

Mirrors, too, intrigued both the Greeks and the Hellenists who came after them.⁴⁵ The problems raised by common optical illusions or, more broadly, the types of problems generated by distinctions too fine to be noted via sensory perception – these attracted far less attention.

The increasing resort to geometric interpretations, such as those in figure 3,⁴⁶ made Euclid's (3d c. BC) law of reflection (the angle of incidence is equal to the angle of reflection) and Ptolemy's (2d c. BC) experimental law of refraction (refraction as a function of the angle of incidence) the two main proofs needed for substantive discussions of vision and misperception.⁴⁷ The Pythagoreans, as is well known, were particularly prone to favor solutions expressed through numbers and numerology, but the Pythagorean theories dealing with sight (as with musical and calendrical harmonies) were not that far divorced from those of many contemporaries. In hindsight, even a casual reading of *The Science Times* reveals the inadequacies of any search for neat geometrical solutions for the very complex processes entailed in perception, but the burning desire to reduce complex effects to quantifiable (and hence more manageable) components greatly appealed to the earliest scientists, no less than to their successors. Indeed, the "Scientific Revolution" – if it can be said to have happened at all – is generally characterized as a series of new practices, institutions, and modes of inquiry that arose sometime between the fifteenth and eighteenth centuries, spurred by "the mathematization of natural philosophy" in conjunction with "the rise of mechanization and materialism, ... and the emergence of full-blooded experimentalism."⁴⁸

Before leaving early Greek optics for early Chinese optics, it should prove helpful to acknowledge similarities between the "cultural manifolds" of classical Greece and China, since scientific ideas do not exist in a vacuum, but rather as "part of a continuum that includes what thinkers want out of life, who they consider their colleagues to be, ...

⁴⁵ Hero of Alexandria (fl. 62 AD), believing that Aristotle had already provided an adequate analysis of the visual process, turned to the science of mirrors.

⁴⁶ Simon believes that this emphasis on geometry accounts for the impulse to quantification underlying much of the so-called Scientific Revolution. According to Simon, not until the Renaissance did people see in planes, such that the appearance of an object lengthens out as a function of its distance from the viewer.

⁴⁷ The remnants of this mathematization of vision exist in the metaphors of "mental computation" for "thinking" or "reasoning."

⁴⁸ Steven Shapin, *Scientific Revolution* (Chicago: U. Chicago P., 1996), p. 168.

how they make sense of the world around them, and what political and social choices they make.”⁴⁹ In both classical societies, the chief subject of epistemological inquiry for those in power was not “knowing facts” but “knowing men”: how best to gather and weigh evidence about the character and proclivities of potential and actual candidates for office. In both societies, too, the governing elites wanted to see and be seen.⁵⁰ Therefore, in both societies members of the governing elite had a duty to construct through their persons and the writings that they left visible and visually arresting exemplary models for the benefit of peers and those of lower status. Retinues of clients, solemn funerary processions and tours of inspection, the intense scrutiny of candidates for office – all these activities were designed to render visible the inward state and status of claimants to power to groups far beyond the family circle.⁵¹ Social visibility was required, in part, because very early on it power-holders came to see that there were real limits to how much physical force can be used to compel others; thus, in addition to wielding brute force, members of the elite were expected to display their charismatic powers (*de* 德) within the political arena. Charismatic power was to be communicated – thanks to the discerning eye – as much through ritualized displays of dress and gestures, of countenance and demeanor, as through wise policies and the florid rhetoric of the standard virtues.

In both societies many of the most sophisticated thinkers took it for granted that appearances outside the family home not only would *not* deceive onlookers, but also prove to be transparent revelations of a person’s character and family traditions. In the standard views, the total effect engendered by the person’s speech, conduct, and look served as a “human portent” no less legible than animal entrails or sky signs.⁵²

⁴⁹ “Cultural manifold” is a term devised by Sivin for Geoffrey Lloyd and Nathan Sivin, *The Way and the Word: Science and Medicine in Early China and Greece* (New Haven: Yale U.P., 2002), pp. xi–xii. Earlier David N. Keightley, “Clean Hands and Shining Helmets: Heroic Action in Early Chinese and Greek Culture,” in Tobin Siebers, ed., *Religion and Authority* (Ann Arbor: U. Michigan P., 1993), pp. 13–51, drew contrasts and comparisons between classical Greece and Shang China, but Edward L. Shaughnessy, *Rewriting Early Chinese Texts* (Albany: SUNY P., 2006), argues that all cross-cultural comparisons are pointless, since China is an exception in world history.

⁵⁰ James N. Davidson, *Courtesans and Fishcakes* (London: St. Martin’s P., 1997), esp. 249, for Greece; for China, see Michael Nylan, “Toward an Archaeology of Writing, Ritual, and Public Display in the Classical Era,” in Martin Kern, ed., *Text and Ritual in Early China* (Seattle: U. Washington P., 2005), pp. 3–49. Geoffrey Lloyd, in *Way and the Word*, chap. 3 (pp. 101–2), emphasizes for Greece the “very limited” demand for teachers of optics – a situation that probably was true in early China too.

⁵¹ The presence of clients, friends, and family – the escort as collective strength – was one of the chief markers of the noble and notable man. As *Analects* iv/25 says, “Virtue never dwells alone; it will always bring in neighbors.” Perhaps the best treatment of patron-client relations is Miranda Brown, *The Politics of Mourning* (Albany: SUNY P., 2007).

⁵² Anecdote after anecdote in the *Shujing*, *Zuo zhuan*, *Hanshi waizhuan*, and *Shuoyuan* (not

The prevalence of such standard views could hardly forestall severe conflicts in both societies over the reigning paradigms of viewing. Such disputes centered on the positive ethical valence accorded visual prominence (a valence inherited from earlier aristocratic eras). Aware of such conflicts, members of the elite in their respective seats of power were quick to seek to control the motivation, origin, and direction of the gazes of others, reserving the right to defend themselves against potentially intrusive or aggressive looks.⁵³ After all, anyone desiring to become the cynosure of all eyes had always to fear being viewed rather as an object of the sort of contempt due to over-exposure.⁵⁴

To create a vivid impression through careful staging of unflinching exemplarity offset by an appropriate measure of exclusivity of access – this was the primary goal of the chief rituals in which the elite participated during the classical era. Both societies “placed a premium upon living up to the judgment of authoritative viewers,”⁵⁵ whose ranks included the dead ancestors and certain gods to whom reports were made and who sanctioned the powerful living in return. Clearly, in the eyes of statesmen and thinkers of the past, memory and cultural reproduction depended more upon the production and correct interpretation of edifying spectacles than political naifs would readily admit. Unfortunately, we know next to nothing about how public monuments and public inscriptions were used in either early society to build favorable impressions. For China, our best evidence for monuments from the classical era comes mainly from later sources, especially Li Daoyuan’s 酈道元 *Shuijing zhu* 水經注 (compiled 526 AD), that resist straightforward interpretation more than generally acknowledged.⁵⁶ Meanwhile, for classical Greece and Rome our best evidence suggests that the potential of such cultural monuments to attract attention was not fully exploited until the time of Augustus.⁵⁷

to mention the *Fayan*’s emphasis on the outward appearances) presume the relevance of the outward appearance to “knowing men” (*zhi ren* 知人). See references at n. 29, above.

⁵³ Compare Bartsch, *Mirror*, pp. 116–21 (esp. 116), speaking of the Roman elite.

⁵⁴ Yang Xiong 揚雄, *Fayan* 法言 3/20–21. (All references are to Han Jing 韓敬, annot., *Fayan zhu* 法言注 [Beijing: Zhonghua shuju, 1992].) Certainly, the evocation of antiquity was linked to the presentation of exemplary deeds (good and bad).

⁵⁵ Bartsch, *Mirror*, p. 124. Cf. Harriet I. Flower, *Ancestor Masks and Aristocratic Power in Roman Culture* (Oxford: Clarendon Press, 1996), p. 14.

⁵⁶ Michael Nylan, “Wandering in the Lands of Ruins: The *Shuijing zhu* 水經注 (Water Classic Commentary) Revisited,” Alan K.C. Chan, ed. (forthcoming, SUNY P.).

⁵⁷ Paul Zanker, *The Power of Images in the Age of Augustus*, trans. by Alan Shapiro (Ann Arbor, Michigan, 1988; rpt., 1990); cf. the seven Sather Lectures given by Tonio Hölscher at the University of California at Berkeley in 2007 (not yet published). Below I present a summary of some of the main ideas outlined by Hölscher in those lectures. Hölscher’s most famous book in English is *The Language of Images in Roman Art* (Cambridge: Cambridge U.P., 2004).

To push the often scanty and ambiguous present evidence just a bit further, if Tonio Hölscher, a classical specialist of Greek and Roman visuality, is correct, the complex reception of the content of classical art did not rely on perfect visibility at all times and places, as most today presume. By what Hölscher terms “an aesthetic theory of decorum,” impressive works – very much like impressive human beings themselves – commanded respect, insofar as they enjoyed a measure of autonomy from close examination.⁵⁸ The ethic of decor and decorum, in consequence, required that works be complete and perfect, regardless of who actually saw them. (After all, “decor,” “decoration,” and “decorum” all derive from the same Latin root, meaning both “appropriate form” and “adornment.”) Classical viewers did not look to subject works to the same degree of intense scrutiny that eyeglasses and the telescope or books and museums and photographs make possible now,⁵⁹ though they aimed to participate in the life of objects and buildings and to have objects and buildings participate in their lives, as well. Robert W. Bagley’s controversial essay on meaning and decoration in early China raises many of the same points considered by Hölscher, with his critics largely ignoring the vastly different occasions and potentials for viewing in the classical vs. the modern periods.⁶⁰

These modern debates about seeing and viewing notwithstanding, all modern scholars recognize that representation via images and mirrors loomed large in classical discussions about ethics. Shadi Bartsch has identified a set of tropes threading through the classical Greek (and Greco-Roman) rhetoric:

1. the material representations of friends, family members, and authorities (past and present) designed to instruct;

⁵⁸ Cf. Bartsch, *Mirror*, passim., on the Roman’s insistence that “freedom” be defined as “freedom from the invasive gaze” or actions of others.

⁵⁹ Hölscher’s work implicitly disputes the influential theory of Michael Baxandall, who argues that ancient works reveal some discernible ‘intention of the picture’ rather than the intention of the designer, by which he means a political-historical reading based on the coherent narrative or compositional structure that disregards stylistic interest. See Michael Baxandall, *Patterns of Intention: On the Historical Explanation of Pictures* (New Haven: Yale U.P., 1985), pp. 41–42. Earlier Erwin Panofsky, *Meaning in the Visual Arts* (Garden City, New York: 1955), p. 21, cautioned that “intentions” can only be formulated in the context of alternatives; a situation has to be supposed in which the maker of a given work had more than one possibility as he proceeded, so that the artist confronted the problem of choosing among various modes of emphasis.

⁶⁰ In the past scholars, in debating whether decorative features had meaning or not, have largely misconceived the issue as requiring a simple “yes” or “no” answer, irrespective of time, place, and type of artifact. For one example of a very smart art historian who misconstrues many of Bagley’s main points, see, e.g., Lillian Lanying Tseng, “Representation and Appropriation: Rethinking the TLV Mirror in Han China,” *EC* 29 (2004), pp. 163–215.

2. the mental images invoked as incitement to follow a commendable path of action;
3. the contrary use of mental images to inhibit activities and feelings (as when the Stoics conjured up vivid images of decay and degradation to inure themselves to human eventualities);
4. the image of the person in the mirror – revealing either the community's judgment or the person's conscience or both – which reflection shows the truly wise and good person to be the one who “attains the greatest pleasure of all” by seeing the self;⁶¹ and
5. the vanity and illusions associated with over-resort to the mirror, which implicitly urged that a higher value be placed upon public, visible deeds and reliable virtues than upon unrealized, wavering, or vainglorious intentions.⁶²

The significance, nay, sheer power attributed to mirrors in the classical era can hardly be overestimated, as mirrors were comparatively rare and expensive objects made of bronze or silver,⁶³ not their cheap glass substitutes from Woolworth's. Mirrors functioned, therefore, as the mark *par excellence* for members of the elite during the classical eras.⁶⁴

The roles assigned the mirror image, mental image, representation, and gaze in the arduous task of self-fashioning underlie all these Greek and Roman tropes, each of which finds a counterpart, as we will see, in classical Chinese texts. As one early account specifies, the ideal man “never ceases to gaze at and contemplate himself; he should also call

⁶¹ Compare Seneca's *De clementia* (On Mercy) 1.1–2, composed 56–55 BC, for Nero. See Miriam Griffin, “Seneca and Pliny, In *The Cambridge History of Greek and Roman Political Thought*, ed. Christopher Rowe and Malcolm Schofield (Cambridge: Cambridge U.P., 2000), 532–45; cf. Xunzi on the *junzi* as mirror for self-contemplation that confers immense pleasure, as translated and discussed in Michael Nylan, “The Politics of Pleasure,” *AM* 3d ser. 14.1 (2001) [actual publication 2004], pp. 73–124, p. 118. In classical Greece and Rome, on the one hand, and in China, on the other, one can agree with Bartsch, *Mirror*, p. 190: “The imperial monopoly on such forms of display inevitably eroded the traditional ... practice of exemplary viewing.”

⁶² Bartsch, *Mirror*, p. 130.

⁶³ The ancient mirror reflected an image only when its polished surface was smeared with black lead and then polished with a white cloth. Some Han inscriptions on mirrors say 金之青(? = 清) 視我形, as reported in Kong Xiangxing 孔祥星, *Zhongguo tongjing tudian* 中國銅鏡圖典 (Beijing: Wenwu chubanshe, 1992), p. 279; the character *qing* 青 in the inscription cited by Brashier, “Longevity,” pp. 201–29, esp. 228, could refer to the black lead, the greeny-black surface of a mirror with patina; or, if read as its homonym 清, to the purity of the metal that facilitated the accurate transfer from person to image. It was well known there is “no resemblance to match the mirror's” (not water; not other substances; and not paintings).

⁶⁴ As Bartsch, chap. 1, points out, mirrors played a dual role, as a means to truth and a fount of illusion reflecting a temporal and unstable self. There is no space to discuss here the role of the face – and especially the eyes – as “windows into the mind.” One early writer said, “It does not seem correct to me to say that the mind is entirely invisible: it reveals itself, as in a mirror, on the face.” The brows and pupils, especially, are assumed to be good indices of sadness, happiness, mercy, severity, as every reader of the *Mencius* knows.

others to emulate himself,” thus “providing a mirror” to others, “by the splendor of his soul and his life.”⁶⁵ The ideal person in consequence epitomizes actor, viewer, and critic, with all three roles presupposing an ongoing and continual commitment to assess the effectiveness of visible performances. As he or she becomes a compelling model and mirror to the self and others, the ideal person seems to foreshadow Damasio’s revised version of the Cartesian theater-as-mind. For to see the self and others accurately – that is the primary task assigned the exemplary humans whose extraordinary clear-sightedness at best may rival that of the all-seeing gods.⁶⁶

Supposedly, then, this classical model of visibility could inspire the necessary move from solipsism to ethical responsibility, including that turn inward to employ the self-as-eye or mirror when the “common wisdom” proves inadequate. Though the goal of ethics within these classical cultures was less to discern the opposition of true and false (as in modern science),⁶⁷ than to distinguish propriety from impropriety, it is hardly surprising that those intent upon laying out the complex processes of acquiring accurate knowledge of the world and the self repeatedly mobilized tropes of vision, light, and the mirror. Only a handful of sources (Zhuangzi and Sima Qian in China and Socrates and the Stoics half a world away) ask us to dwell upon the harsh realization that there may be “no there there” in the mirror.⁶⁸ For if no reliable way exists to comprehensively view the self and others, a virtual Pandora’s box of difficulties immediately arises, beginning with the most basic: whether and how to conceive of a single command center in the self – a hegemon – directing relations among the many sensory receptors within the body. Was the seat of the intellectual and emotional capacities the main locus for processing sensory information, and was

⁶⁵ Cicero, *De republica* 2.69, citing much earlier tropes. Cf. *Xunzi* on self-contemplation, as discussed and translated in Nylan, “Politics,” p. 118.

⁶⁶ Removal from the community’s gaze can indicate a life given over to depravity, as with the First and Second Emperor of Qin. The official “watcher” of the emperor was institutionalized in China via the offices of the censor and the Three Dukes (*sangong*), as noted in Hans Bielenstein, *The Bureaucracy of Han Times* (Cambridge: Cambridge U.P., 1980); Enno Giele, *Imperial Decision-making and Communication in Early China: A Study of Cai Yong’s Duduan* (Wiesbaden: Harrassowitz, 2006).

⁶⁷ A. C. Graham, *Later Mohist Logic, Ethics, and Science* (London: SOAS, 1978; hereafter, Graham), p. 39, notes: “The Mohist does not use a single term corresponding to English ‘true.’” A name or series of names applied to an object either ‘fits’ (*dang*) or it ‘errs’ (*guo*) [Wade-Giles modified to pinyin].”

⁶⁸ J. L. Penwell, “Image, Ideology and Action in Cicero and Lucretius,” *Ramus* 23 (1994), pp. 68–91, p. 81, notes that Lucretius equates the statesman’s desire to construct an image as a cynically wielded “cloak for the pursuit of wealth and power,” citing *De rerum natura* 5.1120–35. Of course, my phrase “there there” conjures up Gertrude Stein’s (1874–1946) acerbic assessment of her home town.

it then the virtual “lord” over other places, or did it merely function as a crossroads or switching mechanism for the rest of the person?⁶⁹

This paper cannot explore satisfactorily all such issues relating to beliefs about seeing.⁷⁰ The foregoing has merely shone a light on some shared concerns of the two classical cultures (mainly the Greek), in preparation for reading in a more enlightened way select passages on optics and vision drawn from the Mohist Classic and other philosophical works in Chinese.

ON THE MOHIST OPTICS

As mentioned above, in classical Greece and early China, optics was an integral part of ethics. For the classical thinkers, a person’s ultimate view of moral issues relied upon serious choices about what and how to thoroughly examine (*guan* 觀) among the myriad sorts of things in phenomenal existence, no less than upon improving the techniques used in seeing.⁷¹ One proposition of the Mohists borrows the language of the *Odes* to make this very point: it states, “The Explanation lies in ‘remaking’ [one’s views and one’s demeanor]” – what one sees and how one is seen – when older takes on the visible require revision.⁷²

This section summarizes the extant Mohist theories devoted to optics and involving gnomons, mirrors, and walls (with the last epitomizing obstructions to viewing). It argues that the early Mohists, like most thinkers who succeeded them during Qin and Han, were preoccupied less than the Greeks with the problem of isolating the ideal and enduring qualities of things and persons. Instead, they sought to understand how best to employ available tools – including the *xin* 心, intellectual and moral capacities, as “ruler” or “arbiter” of the senses – to register and appropriately respond to a myriad subtle but significant changes in time and space. They concluded that, in order to effectively use the range of external and internal tools, a person had to 1. choose a suffi-

⁶⁹ *Zhuangzi yinde* 莊子引得, j. 2, p. 4, lines 15–18. (All *Zhuangzi* citations are to the Harvard-Yenching Institute Sinological Index Series, Supplement 20 [1971]; hereafter, *ZZ*). For the metaphor of hegemon, see n. 33 and its related discussion, above.

⁷⁰ Nor will I have time to discuss light and the sun itself as metaphors for true seeing.

⁷¹ The placement of the optics section may itself be significant, for it follows a Mohist discussion on how to view the same man after he commits a violent anti-social act. See Hui-chieh Loy, “The Moral Philosophy of the *Mozi* “Core” Chapters,” Ph.D. diss. (University of California, Berkeley); consider, too, Graham, A 75 (p. 320): “To act on account of something is to take account of all one knows and judge it [as in a scale] by one’s desires.”

⁷² Mao Ode 75, “How befitting is the Black Robe. When it is worn out, I will make a new one 改爲 [for you].” On the “Black Robe” ode and chapter of the *Liji* by the same name, see Shaughnessy, *Rewriting*, Appendix One, pp. 94–130, which clearly demonstrates the direc-

ciently – but not overly – broad context or framework for calculations, an exercise in judgment that 2. required the person to insure proper alignment of the whole person with tools that can assist alignment, in the hopes of 3. carefully distinguishing at what point in time or space “this” yields to “that” and “like” to “unlike,”⁷³ so as 4. to determine (ideally) or approximate (at least) the real limits of any possible effects under consideration.⁷⁴

At times, both the Mohist optics and later discussions confound these four logically separate tasks, in part because of the slippage inherent in the use of the single term *ming* 明, which means not only “light,” “visual perception,” and “perceptiveness,” but also the ideal “clarity.”⁷⁵ Such conflation tends to impart moral and material connotations to even the first and most basic Explanation given of optics: “Wheresoever the light reaches, the shadow disappears” (that is, light dispels or destroys shadow)⁷⁶ Significantly, for the Mohists, all four aspects in decision-making may involve measuring distances between objects and their relative sizes (the size of images being a function of “tilt and distance”),⁷⁷ and moreover establishing the onlooker’s standpoint as it affects inclination and view.⁷⁸ As one Mohist proposition

tion of interpretation after ca. 300 BC (the time of the Guodian and possibly the Shanghai mss., as well).

⁷³ E.g., Graham, A 96 (p. 345): “If the model [under examination] differs [from something already known], then examine thoroughly wherein it fits [the model]. Choose this and pick out that; ask reasons and examine thoroughly the fitness [of the category chosen for examination of a given problem].”

⁷⁴ See, e.g., Graham, A 42 (p. 294) defining “limits as “wherever, at the next advance, there is no room for a measured length” to fit within the visual arena.

⁷⁵ The precise language used in the Mohist canon helps to disambiguate the eyesight, the sight seen, and the capacity to see clearly or make others see. In talking about seeing, the Chinese author need not confuse these related concepts unless he deliberately *chooses* to employ multivalent language (e.g., that of *ming*), in the manner of the Greeks. Graham, A6, pp. 266–67, speculates that the “curious” use of the single graph *ming* in the Mohist canon to convey at least three discrete meanings (“eyesight,” “clear-headed,” and “clear sight”) suggests that the meanings now attached to the modern graph *ming* were graphically distinguished in early recensions, as is the case now with those attached to *zhi* 知.

⁷⁶ Presumably, the use of *guang* 光 instead of *ming* in that explanation was expressly designed to separate the moral from the material. The ambiguity is lessened but not entirely erased, however, in expressions such as, “The light’s entry shines like an arrow shot” 光之入照若射 (Graham, p. 267).

⁷⁷ A.C. Graham and Nathan Sivin, “A Systematic Approach to Mohist Optics,” in Shigeru Nakayama and Nathan Sivin, eds., *Chinese Science: Explorations of an Ancient Tradition* (Cambridge: MIT P., 1973), B20 (p. 107).

⁷⁸ It is also true that the five sensory experiences (sights, sounds, tastes, smells, and bodily sensations in the limbs and heart) apprehended by the five different organ systems (usually called *wuguan* 五官) are known as the “Five Roads” (*wu lu* 五路), a term that calls up the Great Way. See Graham, B46, 2/4, p. 415. Note the expressive Five Assents (*wu nuo* 五諾), which apparently (?) refers to the five senses in A98 (p. 347). Graham and Sivin, “Systematic

(A41) asserts, “Something may be so in one respect and not so in another,” and so one must always ascertain “things to which the standard applies” (B65).⁷⁹

In consequence, the spatial and temporal conditions for each act of seeing-as-knowing are major preoccupations of the Mohist canons.⁸⁰ The Mohist fashioners of technical language were clearly intent upon avoiding, if not countering the paradoxes of space and time that had been raised by the famous sophists of the fourth century BC.⁸¹ Regardless of the class origin of the Mohists (which early tradition traces to craftsmen), the Mohists had little patience with what they perceived as frivolous questions; they intended to apply the language of the technical arts (*shu* 術) to the most important philosophical issues of their day. Many Mohist problems therefore relate to what Sivin and Graham called “interference phenomena” – that although shadows and images are known to move with their objects, the speed, size, and movement of a given shadow or image do not precisely match those of the object itself. Objects may even disappear or reappear as light falls on them or is prevented from reaching them. An additional problem of great import to the Mohists we might dub “duality”: a single object can cast two or more shadows or images simultaneously (B17). The Mohists (like later thinkers) were inclined to resolve both the interference and duality puzzles through explanations positing sympathetic exchanges taking place between “what is lustrous” (an early version of *qi* 氣?) in the person (who may be looking at himself in the mirror) and “what is lustrous” within the image itself.⁸² Though *qi* theory was not fully developed at the time of the Mohist canons were compiled, as Sivin

Approach,” p. 115, says that the Mohist optics are “very far from the metaphysics of yin and yang... and resonances,” insofar as they represent a “tendency toward geometrization,” but continuing on the same page: “It is quite possible (and most reasonable) that he [the Mohist] saw the world in terms of resonance and other conventional concepts of his time,” as seems evident in B22.

⁷⁹ The Mohist canon is also intent on freeing us from the nagging suspicion that we are “supposing the already ended to be [still] so.” See Graham, B10.33. The Mohist canon would also separate what we “suppose” to be true (*yi wei* 以爲) from what we “know” 知 (correctly) to be true, as in A24.

⁸⁰ See Graham, p. 300.

⁸¹ See Graham and Sivin, “Systematic Approach,” p. 106. This presumably means that the Mohist chapters were compiled after the sophists had devised these paradoxes, but conceivably the Mohists may have anticipated them as well. More precise dating of the relevant texts cannot be established on the basis of evidence available at present.

⁸² See Graham, B22–24 (pp. 373, 382); and, for a slightly different interpretation of this line, G-S (pp. 131–32), which tentatively reads “lustrous” (*ze* 澤) [the quality in a jade that suits it to serve as reflecting surface] for *chou* 臭, which is unintelligible. Graham there writes that the Mohist optics “do not offer any explanation in terms of resonances of things in the same category.”

has shown,⁸³ early optical thinking helped to pave the way for its later popularity.

Like the classical Greek optics, optics in early China usually began with portrayals of the precise relations between objects and visual perception in geometrical terms, since geometry could then supply a few *a priori* pieces of knowledge that were not liable to dispute. With the Mohists, for example, the circle is the perfect example of a thing matching (*dang* 當) its standard, the compass.⁸⁴ The optical theories espoused in the two classical cultures, beyond this superficial similarity, diverged in major ways. Unlike the Greeks, the Mohists seem more interested in the images and shadows (*ying* 景 = 影) cast on surfaces than in light rays (*guang* 光).⁸⁵ Unlike their Greek counterparts, thinkers in China expressed great interest in the effect of changing perspectives on the person's reception and interpretation of visual evidence, though the evidence for this crops up more often in Mohist essays on politics than in the single, short passage apparently devoted to this within the Mohist optics (B21). In yet another contrast to the Greeks, thinkers in China, so far as we know, did not emphasize the impact of sensory perceptions upon the surface of the body, though "knowing," "seeing," and "touching" *are* occasionally analogized to one another in early texts.⁸⁶ Instead, they speculated on the way that particular sights might be received, assessed, and mediated in the body's organ systems. They sought also to distinguish the *zhi* 知 ("understanding," "knowledge," or "intelligence"), the *cai* 才 (the "resources" or "capacities" brought to the task of knowing),⁸⁷ and the *xin* 心, the organ system that "oversees" or investigates (*cha* 察) the sensory perceptions, sorting and categorizing (*lei* 類) phenomena prior to responding or reacting to them (*ying* 應) via conscious and unconscious impulses.⁸⁸ In the dominant model fa-

⁸³ Lloyd and Sivin, *Way and the Word*, Appendix.

⁸⁴ Graham, pp. 56–57, on A52–70, A93, and A98.

⁸⁵ As Graham, p. 372, notes, every relevant passage talks of "images" (which he invariably translates as "shadows," even when the image shows details in addition to the outline of an object), but it is not clear that the Mohists speak of "light rays." References to the straight lines of shadows and light clearly refer to the edges of either generated on a wall; they need not refer to "light rays" of the type envisioned by the Greeks. As Graham, p. 383, says, water travels in a straight line in a waterfall, but that does not make it a ray.

⁸⁶ Graham, A5 (p. 267). "Knowing" is analogized to "passing by a thing but being able to describe its appearance (Like seeing)"; understanding is defined as, "in discoursing upon a thing, to be able to make one's knowledge about it obvious [to all?]." The best summary of the relations between in the senses in Zhangguo texts is Jane Geaney, *On the Epistemology of the Senses in Early Chinese Thought* (Albany: SUNY P., 2002).

⁸⁷ The *cai* are compared to the eyesight which makes us capable of seeing.

⁸⁸ Graham, p. 60, notes that the Mohists did not use *xin* to describe all the intellectual and emotional capacities. For the *xin* as the supervisor and sorter of sensory perceptions, see Gra-

vored in early China, relations between external phenomena and the person tended to be regarded as mutual, sympathetic, and evaluative,⁸⁹ involving complex exchanges, adjustments, and adaptations in real and moving time and space. Given such presuppositions, vision was hardly reducible to simple reflections or refractions of visual rays.⁹⁰ Moreover, thinkers in early China never confused the tool or capacity for knowing from the person having that tool or capacity at her disposal, which multiplied the ways that a single person could appear or be framed differently by different types of people with different tools and capacities.⁹¹ They allowed, too, that “knowing” can persist in the mind long after the removal of an object and the sensory perception of the object, so “knowing” and “sensing” cannot be exactly the same. No blanket assessments – moral or factual – could be made, absent a precise knowledge of the specifics of time, place, and other combinations of factors. (Hence the famous paradox “the eye does not see.”)⁹² As a result, optical geometry led the thinkers in early China not to unchanging constructs but to elaborate notions of subtle yet perceptible transformation and change found in the commentaries to the *Changes* (*Yijing* 易經).⁹³

ham, A89–92 (pp. 342; cf. p. 109). No Zhanguo thinker, so far as I know, explicitly distinguishes between “knowing” as one of several capabilities and as a capacity embracing all the others, though Zhuangzi gets at that very problem when he asks whether the *xin* is “ruler” of the senses (ZZ 2, p. 4, lines 16–19), and the “Hongfan” chapter rates *rui* (highly developed insights) above the other sensory perceptions. Responses may be registered directly or through the subtle medium of *qi* 氣 (configured but invisible energy).

⁸⁹ *Huainanzi honglie jijie*, j. 1, p. 6b: “When understanding (*zhi*) comes in contact with things, then likes and dislikes arise from it” 知與物接而好惡生焉。

⁹⁰ This explains why “knowing” can last long after “seeing”; it can endure despite an external change that removes or even destroys the object seen. Therefore, when the Mohists distinguish four objects of knowing in Graham, A80–A82, A86–87, they do not equate “knowing” with “hearing and seeing” (i.e., perceptual acuity). Graham, A 88 (p. 338) shows that the Mohists also see that the person may be physically present but still “absent” insofar as he or she has not directed his will to notice a specific object or a problem. They moreover argue the importance of being careful to locate things in time as well as in space (in the time of “its being so,” rather than in the past or future of “its being so.”). For the movement of space and time (“duration” 久), see Graham, B13, 2/4, p. 367, and the preceding discussion.

⁹¹ See Graham, p. 60, which speaks of Mozi and Xunzi in this connection, separating “will” and “intent” (both *zhi* 志) from the capacity or faculty of knowing. Ibid. p. 63, directs the reader to A3–A6. That the content and use of knowing are different is the point of many of Zhuangzi’s anecdotes about “the utility of the useless.”

⁹² See Graham, A3, A5 (p. 416); also pp. 32, 267, 415. The paradox is mentioned in *Zhuangzi* 33; it means that the eye is a tool for the seer just as light is a means or medium for the eye. See below for the metaphor equating the “unknowable” or “imperceptible” with what lies “beyond the wall” (*qiang wai* 牆外). Elsewhere, *Mozi*, *juan* 6 says, “The eye cannot see everywhere, the hand cannot grasp everything, the mouth cannot taste everything.”

⁹³ See Nathan Sivin, “Change and Continuity in Early Cosmology: *The Great Commentary to the Book of Changes*,” in *Chūgoku kodai kagaku shiron*, zoku 中國古代科學史論, 續 (Kyoto: Institute for Research in Humanities, 1991), pp. 3–43.

Let us begin with the Mohist discussions of the gnomon (*biao* 表) to see what it says about tools in general and alignment in particular.⁹⁴ (*Biao* is the word used of external standards, and also of the sources of sensory data that are or should be visible to all.) The Mohists start with the knowledge that when the sun is “at center” (*zhong* 中) at noon, it is also “due” (*zheng* 正) south. With a gnomon or similar tool for alignment one plants one or more uprights, so as to calculate, for instance, how far sunrise and sunset diverge from true east or true west.⁹⁵ If the gnomon is itself tilted toward or away from a light source, the width and size of the shadow thrown on a surface perpendicular to the ground will vary from that generated by an upright gnomon, the degree of variance depending on the distance between the gnomon and a perpendicular surface. By a favorite analogy of the Mohists, to align one’s likes and desires with known standards pertaining to the world of external reality is, in effect, to take similar necessary precautions against distortion while “weighing the benefits and harms” of a specific activity,⁹⁶ as on a scale. For the Mohist, alignment obviates the twin problems of “one-sidedness” or “being of two minds” (*ji bei* 畸倍), for which the ears and eyes are not responsible.⁹⁷ It is the duty of the organizing faculties for understanding (whatever names they go by) to judge the ways and extent to which things are like or differ from such approved standards even as they share certain qualities. Only after sensory data have been assessed by the faculties can priorities be assigned to things, persons, events, and claims competing for attention and focus.⁹⁸ To conduct such a process of alignment, according to the Mohists, prevents the person from reaching that the lamentable state “which has no [absolute] wrongs or not-sos” (both *wu fei* 無非). In other words, the act of alignment is hardly meant to preempt all moral or intellectual judgment in a particular case. It is meant to aid judgment.

To take this idea further, B20 in the Mohist optics, along with B22–24, describe the different subjective experiences we have when looking from some height upon a plane mirror and when looking into

⁹⁴ Note the semantic range of the word *biao*, which means “gnomon” but also “visual indication or sign.”

⁹⁵ Graham, A56–57 (pp 306–7); cf. p. 369.

⁹⁶ Graham, A84 (p. 332), altering the suggested punctuation, since both problems must be problems in interpreting value, rather than problems with the perceptual capacities. That “X sees Y” has a problematic relation to “Y appears to X.” As B4 (E) notes, “Seeing and appearing diverge” (Graham, p. 356, also emended).

⁹⁷ Graham, B5 (p. 356), with translation emended.

⁹⁸ Graham, B6 (p. 357), emended: “Which is longer, a piece of wood or a night? ... Which is most valuable, aristocratic rank, one’s own parents, conduct, or a price?”

a concave or convex mirror. (The earliest graphs for mirrors (*jian* 鑑 = 監), it is worth recalling, show a man either looking down into a mirror placed horizontally or looking straight into a plane mirror held at right angles, the mirror being represented as a gigantic eye looking back at the person [figure 4]).⁹⁹ Such experiences afford us at least a glimpse of subjectivity, insofar as the onlookers believe that they do not change, even as their views of their images in the mirror certainly do. After the fairly straightforward propositions advanced in connection with gnomons, the ensuing passages devoted to images and mirrors confront readers immediately with greater complexities, even stark reversals of expectations, since the silhouette of the images found in concave (but not convex) mirrors is upended under certain circumstances.¹⁰⁰ For the early Chinese, as for the early Greeks, light travels in straight paths that intersect at a focal point, but the Chinese writings trace variations in perceptions to multiple factors, including obstructions to the light; relative dimensions, distance, and inclination; curvature of the reflection surface; and the effect of single vs. multiple light sources.¹⁰¹

Regarding the plane mirror 正鑑, B22 tells us, “When one approaches a plane mirror, the shadows [= images] are relatively few,¹⁰² and they can appear [in the mirror] to be light or dark, far or near, tilted or upright, depending on the light.” This acknowledges that many features of the reflection’s appearance do not depend upon the sight “recorded” in the mirror, but upon external phenomena, such as the light source or the tilt of the mirror.¹⁰³ The passage continues: “When mirror and image are aligned properly (*dang* 當), they go and come in tandem.” This statement remains true so long as the mirror and the object reflected are placed absolutely perpendicular to the ground. When the mirror is tilted, the image of the observer tilts away from him and begins to recede, so that the image is compressed into a smaller area. While much of the rest of the reasoning outlined in B22, a Mohist

⁹⁹ Wang, “Mirror, Death, and Rhetoric,” esp. p. 511. But Wang does not note the second (and to me, more intriguing) possibility for the graph.

¹⁰⁰ Graham, B19, B23 (pp. 375–8, 381–84).

¹⁰¹ The occasional effect seen in the concave mirror was explained, somewhat in the manner of the Greeks, by reference to the shifting geometrical relations of the visual cones shrinking and expanding from the focal point and centre of curvature. See below.

¹⁰² Graham and Sivin, “Systematic Approach,” p. 132, notes that for the Mohist the *ying* refers to the outline of an image, whether it be a shadow or an image, and the reflection of the facial features are considered “additional” to the *ying*. This author finds parts of B21 confusing, so no further comment is made here. But clearly, B21 is “the first of a series which deal with the formation of images in mirrors” (Graham and Sivin, “Systematic Approach,” p. 133).

¹⁰³ This proposition, applied to the moral sphere, might support the Mohist call to set up leaders as absolute arbiters of society. On the Mohist’s vision for government, see Loy, “Moral Philosophy,” chap. 4.

passage plagued by textual corruption, remains obscure, the implicit exhortation seems clear enough: to properly align object with mirror (and, by extension, with the *xin* as the main faculty that processes and assesses sensory data received from outside). How to bring mental and linguistic constructs into proper alignment with external realities pertaining to a given time and place is, then, one of the true subjects of the Mohist canons. The Mohist adherent intends to bring many imaginative constructs “face to face” “in alignment” (both *dang* 當) with their correspondent aspects of reality, to see whether and when they match up under shifting conditions.¹⁰⁴

Things are not so simple with the convex and concave mirrors, with both types liable to distortion, though not always for the same reasons. B23 plainly describes the situation where an observer moving steadily towards a fixed concave mirror sees an increasingly larger upright image of himself until his eye reaches the “center 中,” a single term blurring the distinction between what we would now recognize as two separate points, the centre of curvature and the conjugate focus.¹⁰⁵ The observer would then see nothing more until his eye had advanced beyond this “center” at the conjugate focus. The Mohists demonstrated this gap in perception before addressing a related problem in the second half of the same passage, B23: why an image is inverted in a concave (not convex) mirror when the object mirrored is placed “outside” (meaning, on the observer’s side, between the observer and the center of curvature) but the same image is *not* inverted when placed “inside” (that is, on the mirror side, between the center of curvature and the mirror). The straight lines that define the borders between light and shadow (to be distinguished from the “firey” visual rays of the Greek texts) will intersect at a center point whose precise location depends upon many factors, and when these lines reach the reflecting surface of the mirror, they will be reflected back through that same centre.¹⁰⁶ By Mohist reckoning, whether the light is converging or diverging, narrowing or opening out again, accounts for whether the image is inverted or not. Meanwhile, parts of the human body holding the mir-

¹⁰⁴ Graham and Sivin, “Systematic Approach,” p. 134, notes that B21[22] probably conveys the idea of the continuous matter, rather than atoms in the classical Democritean sense. Some propositions in Graham, and Graham and Sivin, “Systematic Approach,” vary by one number in the two editions, for reasons not altogether clear.

¹⁰⁵ Graham and Sivin, “Systematic Approach,” pp. 136–37.

¹⁰⁶ It would require advanced (modern) optics to know that the image when reflected back is not yet inverted, in spite of the fact that we see it as both inverted and on or near the mirror surface. See Graham, p. 383. When the object is placed between the center and the mirror, the light is already “opening out from the center” as it passes the object, while in the other, it is still “converging towards the center” (with the result the image inverts).

ror can obstruct the normal paths of light traveling to the mirror from sources above and below, so that the transmission of the full range of light traveling in lines to the mirror proves impossible, and part of the potential visual field is left in shadow.¹⁰⁷ This section of the Mohist analysis draws attention to yet another curious fact: that the same object may cast a light-filled image, a “reflection,” in some circumstances while creating one or more shadows in others.

With a final example taken from mirrors the Mohists conclude their examination of seeing and vision,¹⁰⁸ noting that a convex mirror can be made to produce yet another optical effect: an image reflected in the concave mirror may grow smaller or larger, depending on both the distance and angle of the observer relative to the mirror (as is true with convex mirrors).¹⁰⁹ Further, the image in a convex mirror is never inverted (contrary to the concave mirror); with convex mirrors images that are too large may appear to careen over (or “bend” at) the edges of the convex mirror, instead of appearing to be neatly captured by the mirror’s edges, as would be the case with a concave example.

The Mohists’ keen powers of observation, which ended in a firm belief that not all differences in images can be attributed to the original thing or person, probably prompted their decision to devise a clear linguistic marker separating “the one that mirrors” (*jian zhe* 鑑者), that is, the person looking in the mirror, from “what is mirrored” (*suo jian* 所鑑), all the parts of that person’s image reflected in a mirror and not just the person’s silhouette as seen in a shadow. By this language, they preserve the important idea that an image cast by a person or an object may appear to be essentially different, if that image casts a shadow on a wall or a reflection in a mirror; shadows, after all, remain whole throughout, whatever their shapes may be while images in a mirror can be composed of disparate and definable parts in changing relations to

¹⁰⁷ “The feet will obscure the light rays from below, with the result that a shadow will be formed on top; the head will obscure the light rays from above, with the result that a shadow will be formed below.” There will be a narrower range of light rays that hits the surface of the concave mirror. As the Mohist classic acknowledges, the degree of obstruction depends on the distances involved. Graham, p. 378, thinks that the reversal of the silhouettes of the shadows cast by head and feet as they screen off the light is the main point of the exercise, as it explains why even a small concave image will produce a full-length image. Cf. Graham and Sivin, “Systematic Approach,” p. 114.

¹⁰⁸ Graham, p. 55, notes the fundamental disinterest the extant Mohist treatises display with respect to the properties of the burning mirror and to physiognomy. Many Han texts, however, relate seeing in a mirror to the act of physiognomizing or being physiognomized, as noted by Wang, “Mirror, Death, and Rhetoric.”

¹⁰⁹ Graham and Sivin, “Systematic Approach,” p. 140 (slightly modified): “The nearer the person holding the mirror, the bigger the image mirrored in it, and also the silhouette of the person.”

one another, whether or not the mirror is held at various angles. Some parts of the mirror image, for instance, may be more foreshortened than others, depending on the relation of the mirror to observer and/or object, though all parts of the image can be connected back to an integral person or object to which the sight “belongs.”

Before proceeding to yet another Mohist metaphor related to seeing, it may be useful at this interim to take stock of the differences in the early Greek and Chinese beliefs about seeing, so as to complicate earlier suggestions about their supposed similarities. Initially, any talk of straight border lines of light and shadow may conjure the ideas put forward by the Greeks, but crucial differences mark the two cultures. There is no indication that the Mohists imagined visual rays of light, though they did imagine light traveling in straight lines.¹¹⁰ Moreover the Mohists stressed the variety of factors that together create an image, an outline, or a silhouette, chief among them being the relative positions of the person holding a mirror, the mirror, and the object, all of which may substantially affect the content of what is mirrored. As Graham and Sivin propose, a Mohist proposition is “attempting to formulate laws of, and an explanation for, perspective,”¹¹¹ a concept missing from the early Greek cases, if Simon’s account is correct.¹¹² Then, too, one Mohist passage linking “what is mirrored” to the “lustrous parts” of the person seen in the mirror possibly suggests some sympathetic interplay between the lustrous substances or aspects of viewer and viewed.¹¹³

The wall is the final metaphor to assume great importance in Mohist and post-Mohist philosophy, symbolizing, as it does, whatever is closed to normal view, whatever even the most keen-sighted person cannot possibly see around or beyond. The Confucius of the *Analects* had likened irredeemably immoral or benighted men to “those with their faces towards the wall,” and the metaphor was popular for centuries afterwards.¹¹⁴ Knowledge was divided into two types, what can be known ahead 先知 [of looking] and what can be known only afterwards (in the Mohist phrase, “after crossing – that is, going around – the

¹¹⁰ Graham, B19 (E) (p. 376), but emending, following Graham and Sivin, “Systematic Approach,” p. 377. See n. 35 above.

¹¹¹ Graham and Sivin, “Systematic Approach,” p. 134.

¹¹² Cf. Lindberg, *Theories of Vision*, p. 13, on Euclid.

¹¹³ Graham, p. 384; Graham and Sivin, “Systematic Approach,” p. 134.

¹¹⁴ *Analects* 10/10 (comparing one who has not studied the Zhounan and Shaonan in the *Odes* to the person who purposely stands with his face to the wall. Cf. Yang Xiong (53 BC-18 AD), see *Fayan* 3.20 (p. 65). The Ru (classicists) were not the only ones to employ the metaphor: in *Laozi* 47, the sage is said to be one who knows everything without “going out of the door” or “peeping through the window” in a wall.

wall”).¹¹⁵ A snowflake is white by definition. The whiteness of a snowflake requires no investigation since “whiteness” evidently inheres in all flakes, considered individually or collectively. By contrast, to borrow a Mohist case, not all stones are white by definition. Thus whiteness is not logically intrinsic to or constitutive of stones; it is “non-essential” to the image of the stone, for the color of the stone must somehow be “added” to the generic shape of a stone in the mind’s eye. This distinction between intrinsic and extrinsic properties has important ethical implications, as is evident: by analogy, the Mohists affirm that not all men are robbers, since the activity of robbing does not define all humans. What lies outside a definition and thus requires special investigation in a given case – that is a subject the Mohists believe merits special attention from wise and worthy men. For instance, many words, including “this” and “that,” simply have no meaning absent implied comparisons. Generally speaking, what will constitute benefit or harm to a particular person in a specific situation cannot be known prior to investigation, as the particulars of the person’s context lie “beyond the wall” (A75), that is, outside direct experience or information obtained from authoritative and reliable witnesses.¹¹⁶ Therefore the Mohist classic hones in on issues that must be settled by “contending over the diverse claims” (A73) generated within specific circumstances and by such standpoints. Meanwhile, however, the Mohists insist that many, if not most ethical and practical issues can be resolved by careful reference to the testimony of respectable witnesses who have themselves partaken of the activity Zhuangzi calls “peering” (*ni* 睨).¹¹⁷

Oddly enough, the Mohist sage, in the end, is defined precisely by his possession of certain kinds of knowledge that exist independently of direct sensory experience: the Mohist sage reckons he knows what constitutes the general “benefit and harm” of all humans (EC), even those that exist beyond the “wall of his [personal] knowing.” Then, too, the Mohist rates “knowing” – “by means of one’s intelligence, to be able to describe a thing once one has passed it”; like seeing” – far below “understanding” (that is, “by means of one’s knowing to be able to assess things so that one’s knowledge of them becomes apparent”).¹¹⁸ For

¹¹⁵ Graham, p. 37.

¹¹⁶ Graham, p. 248, directs our attention to the “a priori” ethical system outlined in the Mohists sect. 1/1/2/5.

¹¹⁷ NB: The early writings in Chinese seem acutely aware of different sorts of seeing (e.g., *jian* 見 vs. *wang* 望), as shown in Tian Xiaofei, *Tao Yuanming and Manuscript Culture: The Record of a Dusty Table* (Cambridge, Mass.: Harvard University, 2005), chap. 1. Cf. the importance of “respectable witnesses” in early Greece, as noted in Suzanne Said, “Myth and Historiography,” *Companion to Greek and Roman Historiography* (forthcoming), pp. 76–88.

¹¹⁸ Graham, A5–6 (p. 266).

the Mohist, certain kinds of knowing depend upon sensory experience, most importantly, seeing and thinking, where the latter is constructed as seeking an image in the mind's eye.¹¹⁹ But were true understanding dependent upon the senses alone, humans could never hope to assess an image, person, or event after they had passed it by. In the Mohist conception, therefore, absent "true understanding" humans lack the very substrate of the humanity that defines them: the memories, experiences, and grounded intuitions pertaining to what lies below the surface. For the Mohists, the human faculty for understanding is good enough for most practical social purposes, even if its employment is frequently faulty.¹²⁰ Hence the perceived need, after people have taken into account any available knowledge in a given context, to set up more enduring standards of value that will find embodiment in the leaders' unerring judgments when facing hard choices.¹²¹

As noted by Sivin and Graham, some work done on the Mohist optics used to presume first of all that the Mohists had in their possession a modern textbook on optics; and second that the Mohists' "scientific" materials had no relevance to the ethical discussions taking place elsewhere in the Mohist classic. (The latter presumption derives more from modern disciplinary boundaries than from any careful reading of the *Moijing*.) In addition, many scholars (including Graham himself) believed that the attacks launched by Mencius in the late-fourth century BC spelt the decline of Mohist influence (and correspondingly lessened demand for their tracts). Despite Mencius, there is no shortage of references to the Mohist classics in the Qin, Han, and the immediate post-Han period, so it seems more likely that the shortage of explicit references to the Mohist classic in those long centuries reflects the nearly complete incorporation of Mohist ideas into mainstream literature, rather than sectarian backlashes against them.¹²² The pairing of Kong and Mo

¹¹⁹ Graham, B46 (p. 267), citing on the relation of knowing to the five senses. For *mao* 貌 as "what can be described," see *ibid.*

¹²⁰ Graham, p. 266–68, points out that the Mohists called this faculty "the knowing stuff/resource," whereas most thinkers described it as the *xin*.

¹²¹ Graham, A75 (p. 322).

¹²² Benjamin Wallacker, "Han Confucianism and Confucius in Han," in David T. Roy and Tsien Tsuen-hsuei, eds., *Ancient China: Studies in Early Civilization* (Hong Kong: The Chinese U.P., 1978), pp. 215–28. Graham, characterizes the Mohist summa "as a powerful weapon in debate" in Zhangguo and Han, although he argues (incorrectly, to my mind) that a Han "victory of Confucianism" silenced the Mohists after Mencius. For this author's rejection of the "victory" convention, see Michael Nylan, "A Problematic Model: The Han 'Orthodox Synthesis, Then and Now,'" in Kai-wing Chow, On-cho Ng, and John B. Henderson, eds., *Imagining Boundaries: Changing Confucian Doctrines, Texts, and Hermeneutics* (Albany: SUNY P., 1999), pp. 17–56.

(“Confucius and Mozi”) in Qin and Western Han texts is a good indicator of the stature of Mohist teachings in the early empires. And the Mohist preoccupation with “center and periphery” (deemed to be as mutually exclusive as “black and white”),¹²³ which parallels their preoccupation with standards and activities that facilitate “being aligned and straight or direct”¹²⁴ – this was to color philosophical discourse for the rest of the classical era in China.¹²⁵ Even the Mohist neat conception of the self composed of two main parts, the form (*xing* 形) and the faculties of cognition (the *zhi* 知 for the Mohists and the *xin* 心 for other writers), found its way into the works of many thinkers such as Zhuangzi, the subject of the following section.

If the Mohists were as influential in the technical areas, including optics and ethics, as this argues,¹²⁶ the evidence presented here should lead us to ask whether the positive term *zheng* 正 (usually construed as “rectitude” or as an “orthodoxy” in the manner of Protestant moralizing) is not better translated, at least in early China, in nearly all early passages as “the process of aligning the body and its faculties” with the available tools at hand, in the hopes of discerning as much as possible about the distinctive causes (*gu* 故), conditions (*qing* 情), duration (*jiu* 久), and courses of development of the myriad sorts of things (*wanwu* 萬物) that exist in relation to that corporeal self.¹²⁷ Of course, whole publishing industries have been devoted to defining the “orthodoxies” that supposedly reigned in imperial China, spanning the so-called “victory of Confucianism” ca. 100 BC to the “Communist Party lines” of the twentieth century. Still, a careful reconsideration of *zheng* as “alignment” quietly opens the door to many retranslations of standard vocabulary items within moral discourse.¹²⁸ Ethics in the classical era

¹²³ Graham, A88 (p. 338).

¹²⁴ Graham, B19 (p. 375).

¹²⁵ The section below treats the *Zhuangzi*, but many such concepts thread through the “Zhongyong” 中庸, for example, as well.

¹²⁶ That ethics was a “technique” or “art” (*shu* 術) has been shown by Mark Csikszentmihalyi, *Material Virtue: Ethics and the Body in Early China* (Leiden: Brill, 2004), and Rune Svarverud, *Methods of the Way: Early Chinese Ethical Thought* (Leiden: Brill, 1998).

¹²⁷ This is not to deny that *zheng* means “even” or “straight” when used of edges or surfaces or directions (as in “due” South in A 56). It registers coincidence with an appropriate standard and it serves as antonym for “slanting,” “biased,” and “inverted.” Graham noted, p. 170, that the Mohist dialectical chapters do not imbue *zheng* with “the flavour of moral rectitude.” That questions of “orthodoxy” are “rare” and unimportant in early China was already noted by Sivin in *Way and the Word*, p. 61.

¹²⁸ E.g., Graham (A 57, 2/4, p. 306): “to be straight (*zhi* 直) is to be aligned (*can* 參).” This definition works much better in the many Han contexts where the man of virtue is said to be “aligned with Heaven” (but not necessarily to be cosmic “co-adjutor of Heaven”). *Can* is the standard term for aligning of two gnomons with the observed heavenly body. Note also in Graham, A83 (2/4, p. 329), the relations between *ji* 吉, *he* 合, *yi* 宜, and *bi* 必. Cf. §1/1/2/5,

did need not to be deeply rooted either in metaphysics or the discourse of righteousness for it to compel attention, as the writings ascribed to Zhuangzi make abundantly clear.¹²⁹

ON ZHUANGZI 莊子

Like many another classic work, the *Zhuangzi* is “patient of interpretation.” One plausible reading of the “Inner Chapters” of the *Zhuangzi* focuses on those parts that show a thinker trying hard to separate “seeing” and “vision” (*shi* 視) from “cognition” (*zhi* 知), so as to discern the possible connections between visible “form” (*xing* 形) and the largely invisible set of capacities that, in attaching values on things, spurs the form to action.¹³⁰ Such a reading emphasizes the contingency of all judgments of any sort, based as they are on extremely limited memories and experiences. “Your life has a limit but there is no [theoretical] limit to [what you should] know,” as the first line of *Zhuangzi*’s chapter 3 warns.¹³¹ This section offers a preliminary reading of the *Zhuangzi* along such lines, the better to assess its arguments concerning beliefs about seeing.

Most thinkers, including the Mohists, took “whatever can be seen with one’s own eyes” as a good “standard” for common knowledge, when not preoccupied with knotty questions of authority.¹³² And seeing something large is conceded to be generally easier than seeing something small.¹³³ Yet the *Zhuangzi* opens with an image of incredible power designed to force an awareness of the inability of the senses, including those of sight, to correctly process information about the world around us: for reasons unknown, a gigantic Kun fish that occupies thousands of miles in space is transformed before our very mind’s

1/1, p. 57, where *xianzhi* 先知 refers to what is known “a priori” or “by definition,” rather than the foreknowledge ascribed to divine or semi-divine beings.

¹²⁹ Graham, p. 59, however, thinks the Mohists “unique in simply ignoring metaphysics.”

¹³⁰ These capacities are loosely called the *xin* 心. A person is routinely described as having two components, the visible form and the invisible *xin*. Many believe the latter to direct the form’s activities, including cognition and will. See, for example, ZZ 2, p. 4, line 2, where Nan Guozi is described as having these two main parts; and ZZ 2, p. 4, lines 15–18, 20.

¹³¹ This section will focus on the “Inner Chapters” of the *Zhuangzi*, citing only a few passages in the “Outer Chapters,” since most scholars agree that the first seven chapters of the text have a distinctive voice, while the later chapters appear to summarize or elaborate the *Zhuangzi*. “Zhuangzi” will be the name I give in this essay to the voice this author thinks she discerns in the Inner Chapters, though we cannot even know whether Zhuangzi was a historical figure.

¹³² Cf., e.g., *Xunzi* 6, pp. 81–82.

¹³³ To see what is small is the definition of what we call “clear-sightedness” (*ming* 明), as *Laozi* 52 puts it.

eye into a Peng bird of equal size. When that bird rises up and flies off, his wings appear to be like clouds stretching across the heavens. “Beating the whirlwind,” his wings roil the waters below and the skies above, setting off “wavering heat, bits of dust, and living things blown about by the wind.” Nonetheless the sky continues to look very blue. “Is that its real color,” Zhuangzi asks, or does it merely look like that because “it is so far away and without an end”? Zhuangzi notes that “when the bird looks down, all it sees is blue, too.”¹³⁴ Apparently, the Peng bird—despite its extraordinary size and strength, despite its god-like ability and the superior vantage point from which it oversees all earthly phenomena—can see no more and no less than mere mortals below.¹³⁵ No living thing, it seems fair to conclude, can acquire a true sense of anything, even the unintended consequences of their own actions as they pass over or through the land. No one can “align their senses,” therefore, even if they are blessedly endowed by a heaven.¹³⁶ Nor can any living thing know precisely where the origins of these perceptual problems lie. Given the last phrase in the single question posed by Zhuangzi within the narrative, they stem in part from the inability of the limited to assess the limitless.

The *Zhuangzi* appends to this portrait of the Peng bird a second story illustrating three related points: a. human seeing implies “evaluating,” and since b. all evaluations rely upon seeing things from a particular vantage point, c. all evaluations are skewed at best and dangerous at worst.

If you look at things from the point of view of their differences, they will be as liver and gall, or Chu and Yue [completely different]. But if you look at them from the point of view of their similarities, all the myriad sorts of things are one. Now, a [worthy] man ... does not know what his ears and eyes should think appropriate. He lets his mind wander in the harmony of what things are (*de* 德).... Seeing things as one, he does not see their [individual] losses and deaths (*sang* 喪).¹³⁷

In consequence, the worthy man flatly refuses either to rely solely on his senses as he proceeds to puzzle a few things out or to be puffed

¹³⁴ *ZZ* 1, p. 1, lines 1–5. Cf. *ibid.* 14, p. 37, line 28: “Those who listen to it but do not hear its proper sound, see it but do not hear its proper form— they fill heaven-and-earth, the entire space that wraps up all six directions. You want to listen to it but have no connection to it, and thus you are deluded.”

¹³⁵ Zhuangzi here implicitly argues against the view, common in Zhanguo and Han texts, that sagehood derives from “superhuman perceptions,” rather than from a “store of knowledge” or “an ability to impart simple truths.” See Csikszentmihalyi, *Material Virtue*, pp. 169–70, who suggests that even the divine (*shen* 神)—a quality associated with the *xin*—is fallible.

¹³⁶ Contrast *Xunzi* 17, p. 310.

¹³⁷ *ZZ* 5, p. 12, lines 8–9.

up by the self-regard (*zishi* 自視, literally “narcissism”) inflated by conventional achievements. In Zhuangzi’s view, too much attention to one’s own person most assuredly obscures parts of the world as it is. (One thinks of the human body parts that prevent part of the light from reaching the Mohist mirror).¹³⁸ Needless to say, no worthy man, by Zhuangzi’s account, is inclined to show off (*shi* 示) his opinions in public debates and quarrels.¹³⁹ The worthy man does not invite others to see him, nor does he see others from the vantage point of convention. He – in stark contrast to the usual powers-that-be – avoids the twin evils of objectifying others and becoming an object of another’s intrusive gaze.¹⁴⁰ As a result, while he has something of the look (*mao* 貌) of an ordinary man about him, he leaves others “no way” for others to physiognomize” (*xiang* 相) him (that is, take the measure of his external likeness as basis for predicting future events or relations).¹⁴¹ In today’s lingo, he travels well below the radar screen.

But notably, the worthy man described in this passage does not entirely abandon the use of his faculties for reasoning, simply because the sensory data and the evaluating equipment available to him are less-than-perfectly suited to his use. In Zhuangzi’s own words, “he uses whatever he knows to get at his *xin* 心 (the evaluating mind and the emotions), and then he uses his [ordinary] *xin* to get at the constant *xin*.”¹⁴² Such formulations remind us that Zhuangzi considers the mundane *xin* and the perceptions it throws off on the basis of sensory data as major contributors to, if not creators of the muddle of emotions and ideas that humans carry along through life as baggage.¹⁴³ The worthy

¹³⁸ In *ZZ* 3, pp. 7–8, lines 6–10, the Butcher Ding story, the Butcher, after a certain point, no longer uses his eyes to see 不以目視 a particular ox, but instead proceeds by his intuitions to discern the invisible. See *ZZ* 1, pp. 1–2, lines 17–24 for self-regard. In the Inner Chapters, there are no fewer than thirty-seven instances where *zi* (self) is used. What the self actually consists of, and what constitutes a human being, are two of the most insistent questions posed by the *Zhuangzi*.

¹³⁹ *ZZ* 2, p. 5, lines 58–59.

¹⁴⁰ For the intrusiveness of the gaze, see, e.g., *ZZ* 6, p. 18, line 70, where Kongzi says of the sage: “Why should they show themselves off (*guan* 觀) for the sake of the common herd’s ears and eyes?”

¹⁴¹ For the first quotation, see *ZZ* 3, p. 8, line 10; for the second, see *ZZ* 7, p. 20, line 24.

¹⁴² *ZZ* 5, p. 12, lines 7–8. What the constant *xin* is Zhuangzi does not explain; perhaps it is whatever impulses direct the universe. Cf. *ZZ* 5, p. 13, line 9. This author disputes the common wisdom that Zhuangzi argues for relativism or the human inability to understand. *ZZ* 2, p. 4, lines 27–29 says, in connection with there being no fixed “rights and wrongs,” since all assessments depend on one’s current standpoint: “from the point of view of ‘that’ you cannot see it, but through understanding, you can know it.” The steady and discerning look (*guan* 觀) is, in fact, to be brought to bear upon as many things as is feasible.” Cf. *ZZ* 2, p. 6, line 70.

¹⁴³ This is the point at which Zhuangzi parts company with Xunzi, for Xunzi credits the *xin* with being a reliable enough processor of sensory data, since the *xin* also stores memory, ex-

man, according to Zhuangzi, understands enough to seek a better mirror in all his thoughts and actions; he gives short shrift to conscious actions and values since societal imperatives are too distorted, too partial, and too shifting to provide humans with reliable guides. Zhuangzi would have us seek a better instrument for seeing and understanding, despite the fact that the ultimate vision of the “constant *xin*” is bound to elude us, for the search alone brings home to us a great many lessons about human fallibility.¹⁴⁴ The single goal for Zhuangzi throughout is clarity of vision, of course. Of that there can be little doubt, since the *Zhuangzi*, in a rare resort to rhetorical reiteration, chooses precisely that phrase several times in its most stunning lines.¹⁴⁵ It is not likely to be mere coincidence, then, that the *Zhuangzi* is by far the most visually arresting of all the literary works composed in classical Chinese before Sima Qian.

The compelling effects are built not merely through the steady supply of anecdotes in the Inner Chapters that require seeing in the mind’s eye the stories as they are unfolding. Over a hundred times, by my count, the Inner Chapters tell us to see in our mind’s eye events that are principally concerned with seeing. Someone has gone to see someone else.¹⁴⁶ Someone’s external form elicits a description or some admirable figure with insights wears a paradoxically dazed and unseeing look.¹⁴⁷ Alternately, we are outright implored to notice something tends to get overlooked, often because an earlier sight has aroused expectations that are mostly unwarranted.¹⁴⁸ At times, we are explicitly

perience, and learning. The ears and eyes cannot be made more acute by learning, says Xunzi, but the *xin* can be so made. Should the *xin* become in any way unsettled, however, “external things will be anything but clear.” See *Xunzi* 17, p. 309; 21, p. 405; 23, p. 436.

¹⁴⁴ The closest the Mohist canons get to anything like this is in two passages (identified as glosses by A.C. Graham, in *Later Mohist*): NO9-10 (pp. 489-90), both of which talk about “an empty space in the heart,” and a “settled heart” (*ping xin* 平心) that is “without desires and dislikes.”

¹⁴⁵ *ZZ* 2, p. 4, lines 27, 31. Cf. *ibid.* 2, p. 4, lines 45-47 (2x): “What they [the sages] preferred, they try to make clear; what they were not clear about, they tried to clarify.” Cf. *ibid.* 5, p. 13, lines 17-18.

¹⁴⁶ E.g., *ZZ* 1, p. 2, line 34.

¹⁴⁷ See, e.g., the description of Mengsun given in *ZZ* 6, p. 18, lines 76-80; cf. 5, p. 12, line 2. *Xing* (“form”) is used some 34x in the Inner Chapters; a person’s “form” becomes a way to talk about the person’s body or self (*xing qu* 形軀). By Zhuangzi’s account, the person of insight is routinely described as one who no longer sees clearly and goes about the world in a seeming daze or fog, in no small part because seeing prompts dangerous desires. Blind men (especially blind musicians) and craftspeople perceive a great deal, insofar as they see less with their eyes and more with their minds’ eyes.

¹⁴⁸ E.g., *ZZ* 1, p. 3, line 44; 2, p. 3, line 7. Nanguo Ziqi, a sage, stares “blankly/vacantly,” “as if he’d lost his companion.” For a sight prompting expectations, see *ZZ* 2, p. 6, line 76 (2 x).

enjoined to distinguish between the formless and the visible, in the hopes that we may credit a sense of importance to the not yet visible.¹⁴⁹ At the same time we are urged “not to see the self in” others, conflating their interests and lives with our own. By such means, the reader is repeatedly made “to take a look at his own aloneness and singularity” (*jian du* 見獨) as a prelude to seeing all phenomenal existence as one.¹⁵⁰ As Zhuangzi notes,

If a thing has no form 形, then numbers cannot express its proportions 分, and if it cannot be encompassed, then numbers cannot reach to infinity [to express it]. We can use words to talk about the coarseness 粗 of things and we can use ideas to visualize the finest part of things 可以意致者, 物之精. *But what words cannot describe and ideas cannot succeed in visualizing* 意之所不能察致者 — this has nothing to do with coarseness or fineness 不期精粗焉.¹⁵¹

Apparently, the “Way has its tendencies and its tallies and signs” that are apprehensible by this constant *xin*. It can “be got at but it cannot be seen” by the ordinary eye.¹⁵² And since neither everyday tools like the mirror and compass,¹⁵³ nor the prevailing societal standards (not even the most edifying history-as-mirror) affords a man a steady and accurate glimpse of himself or the world-at-large, Zhuangzi’s exemplary human shifts his gaze to a place deeper within the self or else he moves to embrace the wider cosmos.¹⁵⁴ (Obviously enough, Zhuangzi here parts company with the Mohists’ relentless oversight of society and the social.) The sheer persistence of that desire to keep looking at things — with one’s own person accounted but one thing among others — that

¹⁴⁹ E.g., *ZZ* 2, p. 4, line 15: “If there is a true ruler/master [of the self’s operations], I cannot see (*mian* 覩) its form; but that it can act, I already believe. Yet I cannot see its form; it has his affairs but is without form.”

¹⁵⁰ E.g., *ZZ* 5, p. 14, lines 38–39: “When Kongzi went on a mission to Chu: he saw some suckling pigs nursing at their dead mother’s breasts. After awhile, they gave a start and they all abandoned her and ran away. ...They did not see themselves in her — that’s all” 不見己焉爾。For *jian du*, see *ZZ* 6, p. 17, line 41(2), which inevitably calls up the famous injunction in the “Zhongyong” to *shen qi du* 慎其獨 (“to be careful about one’s *du*”). Cf. *ZZ* 8, p. 22, lines 30–31 (3 x): “What I mean by clear-sighted 吾所謂明 is not seeing that other person, but rather to see oneself and that’s it 自見而已。 *ZZ* 6, p. 17, lines 40–42, describes discerning one’s singularity as the prelude to seeing all unique events and things as one.

¹⁵¹ *ZZ* 17, p. 43, line 22. The “Autumn Floods” chapter cited here does not belong to the Inner Chapters, but is generally thought to provide one of the better restatements of the arguments from the first seven chapters.

¹⁵² *ZZ* 6, p. 16, line 27 (2x)-29. Much later, Zhu Xi (1130–1200), in his *Yulei* (*juan* 5) must still resort to talk of a seat of moral intuition lodged in the *xin* or *shen*, while acknowledging the severe limitations on the “investigation of things” by the senses.

¹⁵³ *ZZ* 8, p. 21, line 13: “To await/rely on a hook, string, compass, and square before making something well aligned, this is to harm/pare away at one’s own nature.”

¹⁵⁴ *ZZ* 5, p. 13, lines 9–10, 17, on good mirrors. Cf. *ZZ* 14, p. 38, line 54.

marks the figure of Zhuangzi out from the crowd.¹⁵⁵ Then that same levelheaded constancy may yet allow him to better serve himself and others as a mirror of the things that must be viewed with the constant *xin*, if not with the eyes.¹⁵⁶ As Zhuangzi remarks at one point, “‘There are no men who mirror themselves in running water. They mirror themselves in still water. Only what is still can still ... many other things.’” Unlike most mortals, the sage gives his “considered view” (*guan* 觀) of things; he observes (*jian* 監) the ways of the world; he frequently turns round in order to give things a second look after passing them by (*gu* 顧).¹⁵⁷ An extraordinary amount of looking and seeing goes on in the *Zhuangzi*, occasioned by a sense of the continual changes in the views to which a thoughtful person directs her attention once the dimmest outline of the Way can be discerned.¹⁵⁸

If the *Zhuangzi* refuses to specify what the thoughtful person comes to look at because no neat formula will suffice, how a person is to go about the act of looking becomes clear enough. The wise person is to make sure that he or she is well-aligned (*zheng* 正) and also “without adulteration” (also *zheng*).¹⁵⁹ One of Zhuangzi’s exemplars fairly shouts, “Align your person!” so as to attain harmony with everything and everyone.¹⁶⁰ And the sage always “aligns himself before he carries things out.”¹⁶¹ But rather than righting his Five Senses, as the Mohist would

¹⁵⁵ All of Zhuangzi’s groups of friends are described as watching each other, as spheres of operation for the processes of change. Another hero in *ZZ* 6, p. 17, line 49, looks at himself in well water, so that he can more closely observe the unfolding natural processes.

¹⁵⁶ *ZZ* 7, p. 21, line 32: “The Perfect man (ultimate man) uses the heart and mind like a mirror – going after nothing, welcoming nothing; respond but not storing up things.” Cf. *ZZ* 13, p. 33, line 4.

¹⁵⁷ *ZZ* 1, p. 2, line 31; 2, p. 6, line 70; 4, p. 11, lines 65–66; 5, p. 14, line 35; 6, p. 18, line 70; 6, p. 19, line 86, for *guan*. The same *guan* is used for visually compelling spectacles in *ZZ* 1, p. 2, line 31; 4, p. 11, lines 64–66 (2 x); 6, p. 19, line 86. This explains why *guan* is the verb used of rapt contemplation of religious objects. (Watson’s translation of *guan* 觀者 as “sightseers” sounds far too casual, though “gawkers” might do.) For *gu*, see, e.g., *ZZ* 1, p. 3, line 44. Butcher Ding says that the secret of “caring for life” lies in giving *four* looks to size things up.

¹⁵⁸ *ZZ* 17, p. 42, lines 20–24: “Men who debate such things these days all claim that the most minute thing has no form and the largest thing cannot be surrounded or encompassed.... Before we can speak of coarse or fine, however, there must be some form.”

¹⁵⁹ As in the expression *zheng se* 正色, “true or pure color.”

¹⁶⁰ *ZZ* 4, p. 10, lines 56–57, said by Boyu. Cf. *ZZ* 5, p. 13, line 11 (2 x), which says, “Of those that have received life from earth, only the pine and cypress maintain [their color], green as ever in winter or summer. Of those that have received life from Heaven, only Yao and Shun were aligned properly. Fortunately, they were able to align their lives so that they could align the lives of others.”

¹⁶¹ *ZZ* 7, p. 19, line 6. Here my translation differs from that of Burton Watson, *The Complete Works of Chuang Tzu* (New York, Columbia U.P., 1968), p. 90, which says, “he makes sure of himself first, and then he acts.”

have him do, Zhuangzi's sage sees to it that he is aligned with the Way and its Power.¹⁶² Put another way, the so-called Ultimate Alignment does not depend upon aspects of phenomenal existence, for it "never loses sight of the person's very own nature and fate"¹⁶³ – what Zhuangzi elsewhere calls "the essentials."¹⁶⁴ Due care for alignment requires the person to note the precise placement of her own line of sight, lest crucial parts of the total picture be overlooked (in the manner of those sights falling off the convex mirror's edges) or distorted in some way (as happens in a concave or plane mirror when tilted). Moreover, the additional problem of too many sights bringing too many possibilities threatens to keep the person from seeing any single thing with sufficient clarity ("Have you never seen the tossing and trembling that goes on?"). For Zhuangzi, the problems of seeing would be stunningly evident, even if appearances were not already inclined to deceive.¹⁶⁵

A large part of this personal alignment requires "being able to face loss squarely" as well as not being "blind to one's own errors."¹⁶⁶ Another part requires the recognition of the "right time" (*dang shi* 當時) to act.¹⁶⁷ And yet a third, an acknowledgement that "this" blurs imperceptibly into "that" in the real world, despite the series of artificial dividing lines proposed by the Mohists.¹⁶⁸ An eagerness for fame, for example, inevitably diminishes the perceptive powers; indeed, so great are the distortions induced by it that ambitious people routinely misjudge the relative importance of death and life and misconstrue displays of power as guarantees of longlasting pleasure.¹⁶⁹ This type of incremental error accretes until a monstrosity occurs, when "the appearance of this-yes and that-no makes for the Way's very deformation."¹⁷⁰ The

¹⁶² ZZ 8, p. 21, line 2: "everywhere to promote *ren* and *yi*, and to use them, lines up in the Five Sensory Organ Systems (?). [But] it is not the right alignment for the Way and its Power."

¹⁶³ ZZ 8, p. 21, line 8 (2x), saying, 非天下之正正也。彼正正者 不失其性命之情。

¹⁶⁴ ZZ 5, p. 15, line 59: Zhuangzi says to "Huizi: "You, now – you treat your spirit like an outsider.... You belabor your essential energies 今子外乎子之神, 勞乎子之精, .. Heaven picked out a body for you and you use it to gibber about "hard" and "white."

¹⁶⁵ For appearances that deceive, see above (the Peng bird) and ZZ 7, pp. 20–21, lines 19–20(2x), 21, 22–24, 27.

¹⁶⁶ ZZ 5, p. 13, line 20.

¹⁶⁷ The *Zhuangzi* uses the expression *dangshi* many times, including in ZZ 9, p. 23, line 8; 10, p. 25, line 31; 16, p. 41, line 5; 19, p. 50, line 57; 24, p. 67, line 62.

¹⁶⁸ ZZ 2, p. 6, lines 68–70.

¹⁶⁹ Note the contrast between Zhuangzi's view and that expressed in the opening paragraphs of Xunzi's "Li lun" 禮論 ("On Ritual") chapter (chap. 19), whose opening passages instructs the ruler to play upon his subordinates' eagerness for fame to exact self-sacrifice, even unto death, of them.

¹⁷⁰ Wu Kuang-ming, *The Butterfly as Companion: Meditations on the First Three Chapters of the Chuang-zu* (Albany: SUNY P., 1990), p. 188, with a minor modification (citing ZZ 2, p. 5, line 134).

wise person, seeing this, will not “use the eyes to see” if he wishes to approach the divine; “the sensory organs [must] know when to stop” when the recalcitrant “spirit wants to move.”¹⁷¹ (Hence the unexpected demise of the powerful Hun-tun, who up and dies the very moment he is gifted with the five senses.) As true discrimination lies in “what is not seen,”¹⁷² too strong a spotlight directed to any one phenomenon obliterates vision. A gentle Shaded Light (*bao guang* 葆光) is preferable to glare when a person really wishes to look at the particular features of a thing, person, or event.¹⁷³ “The Way that is manifest is not the Way,” since the Way and its appearance are separate.¹⁷⁴

Before engaging in this academic search for the tropes of seeing and vision, there were parts of *Zhuangzi*’s Inner Chapters which this author thoroughly disliked. In particular she hurried over two stories: the famous dream of the butterfly, in which Zhuangzi cannot tell whether he is Zhuangzi dreaming of being a butterfly or a butterfly dreaming that he is Zhuangzi, and the sharp exchange between Penumbra (*wangliang* 罔兩) and Shadow.¹⁷⁵ The latter goes something like this: Penumbra asked Shadow, “In the past you were walking, but now you stop. In the past you were sitting, but now you get up. Why is there no fixity and independence in your activities?” Shadow replied, “Am I like this because I have something to wait for and depend upon? Is what I wait for and depend upon like this also, since it, too, has something to wait for and depend upon? Is my waiting and dependence like that of a snake upon his skin or a cicada upon his wings – or is it not? How would I ever know the reasons for what is and is not the case?”¹⁷⁶

Penumbra has a lot of nerve. His profile comes in and out of view, depending upon the brightness of the object he travels with, and he commands far fewer shifting shapes than those of his friend, Mr. Shadow. The eye cannot perceive objects well without shadows or penumbras; dark and light are dependent upon one another as things progress through serial changes that take them long distances from where they started. As Zhuangzi has already pointed out, “knowledge,” like the Shadow, “must wait for something” but “what it waits for is never

¹⁷¹ ZZ 3, p. 7, line 6.

¹⁷² ZZ 2, p. 5, line 57.

¹⁷³ For the Way that is like Shaded Light, see ZZ 2, p. 6, line 62. Wu, *Butterfly*, p. 420, fn. 65, argues persuasively that one anecdote in the Zhuangzi overturns *Analects* ii/1, suggesting that Yao should not be a dazzling sun or Dipper star, but a lesser light.

¹⁷⁴ ZZ 2, p. 5, line 59. For the separation of the Way and its appearance, see ZZ 5, pp. 14–15, lines 56–58.

¹⁷⁵ Penumbra is defined as *wai wei yin* 外微陰.

¹⁷⁶ ZZ 2, p. 7, line 93.

certain.”¹⁷⁷ From Penumbra’s point of view, the Shadow has no true self and in some sense Penumbra thinks he can not only define but also confine the Shadow with rude remarks. After all, he, Penumbra, marks the Shadow’s edge. The wiser Shadow responds with a query: does any object, person, or thing have a single true corporeal self or even a true cause? That a given thing, person, or event could only be advantageous or that the subjective experience of self could ever be at once one and independent – both these are ludicrous ideas, surely, as is clear from two other stories in Zhuangzi’s second chapter that allude to the hustle and bustle that characterizes the sleeping and waking states alike, dragging divisiveness and anxious longing forever in its wake. That our nightly excursions in dreams feast our mind’s eyes with a virtually infinite range of activities, persons, and objects does not in any way prevent us from sensing a lack of satiation. Invariably people are left with the uncomfortable sense that they are not quite yet what they think they are, nor what they have been before or would be in future. And if even themselves, not to mention the others, prove this elusive, seeing cannot be believing for people any longer. Though humans are condemned to try to create meaning, they ardently wait for something that will teach them to “breathe with the heels,” not shallowly with the throats, while taking a measure of amusement in the predicaments that they receive.¹⁷⁸

It remains for the butterfly passage to explode the very framework in which people view what they are seeing, moving relentlessly from optics to vision. A person’s corporeal self during sleep is “like the soul that comes in contact with those who are awake.”¹⁷⁹ More importantly, the simulacra of the daily world that appear in dreams are no longer pale and decidedly lesser manifestations of reality, as they would be with the Greeks or possibly the Mohists. With Zhuang Zhou’s butterfly, they represent the very substance, prop, and foundation of humans’ complexly related experiential worlds. For the senses and desires seem no less real and alive to people when they are dealing with phantoms or fears. People respond always to stimuli with genuine concern, no matter what the prompt, no matter how limited our capacities to deal with it. (Fast-forwarding to modern neuroscience, an estimated eighty percent of dreams are nightmares, the products of an overactive amygdala re-

¹⁷⁷ *ZZ* 6, p. 15, line 3.

¹⁷⁸ Camus, Sartre, and Merleau-Ponty all repeatedly use the phrase “condemned to meaning.”

¹⁷⁹ *ZZ* 2, p. 3, line 10: 其寐也魂交其覺. Wu, *Butterfly*, p. 215, takes *wangliang* to refer to only the outline or contour of the shadow.

hearsing dreaded situations that leave us tossing and turning.) And so, caught up in a tangle of over-interpreted scenes, people dream their lives away, and it matters not one whit whether or how well they separate the world they dream of from the world they see when they are awake. To all the worlds that they meet they return varying degrees of awareness, depending upon the time and inclination; nonetheless, people meet them all sensations on level ground, with each discrete encounter and response inscribing their consciousness and habits as they pass along.

One of my favorite essays on Chinese philosophy concerns the supposed gap between “is” (that is, the way the world is) and “ought” (human ethics).¹⁸⁰ And in my own earlier writings, I have also repeatedly cited the influential work by Kenneth DeWoskin, which argues that in early China, prior to the impact of Buddhism in the first centuries AD, the faculty of “hearing” was distinctly privileged over that of “seeing.”¹⁸¹ I now believe – with all the fervor of a recent convert – that the real problem for thinkers, in Zhanguo and Han at least,¹⁸² was not so much the gap between “is” and “ought” (certainly a major problem for thinkers in the Western tradition), but that between the “truly aligned” and “misaligned.” So many early works, including the polemical and apocryphal literature, expound at great length upon the hazards of misalignment while extolling the benefits of proper alignment. At the same time, so many early works acknowledge that the same phenomenon, person, act, or event will inevitably appear different to observers in different contexts. Hence all the extended talk about seeing in early China. Zhuangzi comes as an enormous relief, then, in that he plainly asks what we intend to align ourselves with.

A.C. Graham insists that the Mohists had gone much further in logic than Zhuangzi’s second chapter, “On Seeing Things as Equal.” The Mohists had conceded that all names are conventional and equally inappropriate, but they had also seen, according to Graham, that this hardly matters so long as the names distinguish one reality from another in appropriate ways.¹⁸³ Zhuangzi readily concedes the paltry fact of

¹⁸⁰ A.C. Graham, “Taoist Spontaneity, ‘Is’, and ‘Ought,’” in Victor Mair, ed., *Experimental Essays on Zhuang Zi* (Honolulu: U. Hawaii P., 1983), pp. 3–23.

¹⁸¹ The examples used by DeWoskin, *Song for One*, are sometimes misleading, as “what is heard” (*wen* 聞) includes what is read, as well as what is known through memory and experience, not just what is apprehended through the ears, whereas we might include what we read under “seeing.” See also n. 37, above.

¹⁸² I am no specialist on late-imperial China, so the scope of my remarks focuses on early China.

¹⁸³ Graham, p. 39.

linguistic conventions, but I suggest that he prefers to speak about far more intriguing matters: the interdependence, fragility, and fallibility of all our categories and senses of the world as we go about unwittingly and witlessly slapping values on people, things, and events. Zhuangzi also would have us discern the subjective relation between the experience of vision and imagery, and its undoubted effects upon the way we think. If Zhuangzi is then an anti-rationalist, it is because he has seen and sensed the inability of human reasoning to find a secure standpoint from which to align its views of the myriad sorts of things.¹⁸⁴ Sights theoretically visible to all are but rarely seen by the few. And “unless the irregularities build up to the point of becoming manifest, even a sage cannot recognize them.”¹⁸⁵ So how are we to know anything, and where are we to lodge? Surely the logic of life entails a bit more than resolving the vagaries of imperfect reflections. The unreliability of sensory percepts and hence, all experience is not so easily explained away by references to good tools.

The *Zhuangzi* supplies us with a few signposts for living, one signpost being the treatment of friends in its text. My favorite story provides a sketch of Masters Si, Yu, Li, and Lai, the basis of whose friendship is that they all “know that life and death, existence and annihilation, are all but a single body.”¹⁸⁶ At one point, Master Li remarks to his friend Master Lai, “Get back! Don’t disturb the process of change!” – so absorbing is that process to watch. Perhaps it contains clues?¹⁸⁷ In a second story, three friends refuse to “fret and fuss about the ceremonies of the vulgar world or to make a display for the ears and eyes of the common herd.” This congenial attitude makes the friends like “fish who thrive in the water.”¹⁸⁸ Nathan Sivin has always struck me as a person who thrives in the element in which he chooses to swim; he relishes looking at everything under the sun, including human folly itself. Though an essay by me cannot hope to capture his tough yet exquisitely refined way of looking at things, this essay represents a first dip in the spring season into the stream where Nathan has spent his

¹⁸⁴ For Zhuangzi as an anti-rationalist, see Rosemont, “Who Chooses?,” p. 248.

¹⁸⁵ Mei Wending (17th c.), *Lifa tongkao* 歷法通考 (rpt. Taipei: Yinwen yinshuguan, 1971), in *Meishu congshu jiyao*, cited by Sivin (private communication).

¹⁸⁶ ZZ 6, p. 17, line 46.

¹⁸⁷ Cf. *Laozi* 14, which speaks of subtle clues as what “one grasps but does not possess.” Thanks to Miranda Brown and the members of my current undergraduate seminar for bringing that line to my attention.

¹⁸⁸ ZZ 6, p. 18, line 72.

entire career: one where science coexists with the rest of life's marvels. The essay renders thanks to him and profound affection.

LIST OF ABBREVIATIONS

Graham	A. C. Graham, <i>Later Mohist Logic, Ethics, and Science</i>
<i>Xunzi</i>	<i>Xunzi ji jie</i> 荀子集解
ZZ	<i>Zhuangzi yinde</i> 莊子引得

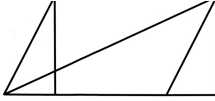


Figure 5.1
An example of a figure that might be drawn in the course of proving a theorem in plane geometry.

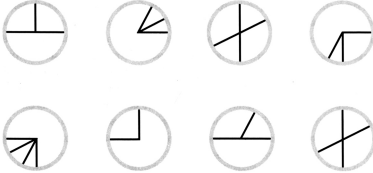


Figure 5.2
An example of the kinds of partial glimpses one might get in the course of examining figure 5.1. The problem is to keep track of which of these glimpses are of the same parts of the diagram. This is an instance of a ubiquitous problem in vision known as the "correspondence problem"—putting into correspondence different elements in the proximal (2D) image that arise from the same element in the distal (3D) scene.

Figure 1. Retinal Functions Recomposing Sensory Data

Here from 2-D to 3-D; after Pylyshyn [see n. 9, above], p. 203 (fig. 5.1-2).

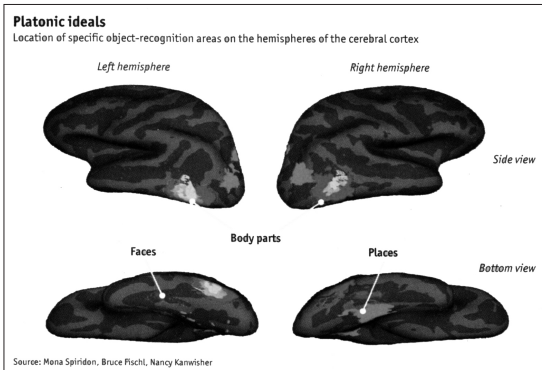


Figure 2. Single Human or Animal Form on the Move

Registering initially in several sectors of the brain; from "A Survey of the Brain" [n. 10, above], p. 9.



Figure 4. Earliest Graphs for Mirrors (jian 鑑 = 監)

After Wang [see n. 1, above], p. 511 (fig. 1, "Earliest Graphs").

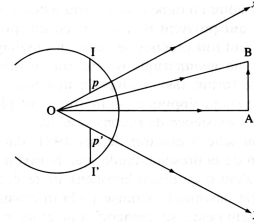


Fig. 1. Le cône visuel antique

O Sommet du cône visuel xOy Cône visuel
II' Iris pp' Pupille
AÔB Angle sous lequel est vu le segment AB

Le cône de rayons visuels se suffit à lui-même. Les anciens ne traçaient ni le globe oculaire, ni le trou de la pupille. Ils ne figurent ici que pour faciliter la comparaison avec la théorie de l'intromission d'Ibn al-Haytham.

Figure 3. Geometry of Greek "Extramission" and "Intromission" Theories

From Simon [n. 30, above], p. 19, (fig. 1, "The Antique Visual Cone").

