

BOOK I: Greek and Roman Thought

I. Beginnings — Philosophy and the Scientific World View

1. PRELITERATE THOUGHT — SPIRITS AND MAGIC

The owners of fish magic will often dream that there is plentiful fish. The cause of it is the magician's ancestor spirit. Such a magician would then say, "The ancestral Spirit has instructed me in the night, that we should go to catch fish!" And indeed, when we get there we find plenty of fish, and cast our nets.

A Pre-literate Fisherman^{1,2}

How people saw the world and their place in it before writing arose must be inferred from the thought of early literate and modern preliterate societies.³ Although these societies vary a great deal in their views of the world and their ways of life, widespread in them is one notion to which people in modern civilized cultures, or at least in their intellectual elites, do not generally subscribe, that everything that happens in the natural world happens because of the activity of spirits.

I would not suppose pre-literate people see spirits where we see trees and rocks—their everyday world is surely much like ours, and more often than not, they take no note of the spirits. The difference lies in the

¹A remark on my footnotes and endnotes is in order. I use endnotes (in conjunction with the bibliography) to cite my sources and my evidence (keeping myself honest), and suggest good secondary literature and good translations, in case someone wants to track these things down for herself. When engaged in a consecutive discussion of a single work or author I will use abbreviated parenthetical citations in the text, to save space. I use footnotes to present more difficult points and more complex discussion, in particular of the historical evidence, which I assume most of my readers will not be interested in, but which a professional philosopher or historian of philosophy would find useful. In particular, I try to inform the reader when I'm departing from standard views in the field, or from views that used to be standard, so that the reader is likely run across them in other readings. I cannot argue in detail for the superiority of the interpretations I adopt, but I can direct the reader to relevant literature, and state baldly my chief reasons. In fact, one argument I would advance for my interpretations of specific points and authors is that they form part of a coherent over-all view of the history of philosophy, which one can only establish by going through this whole work, or at least many related parts of it. So I settle for an appearance of dogmatism on a lot of points, trusting that anyone who reads all I've said will see why I make the decisions I do. (That is not to say he will agree with my decisions, of course.) I also use footnotes to lay out basic information which some readers may not have, though I confess I take it that my readers have a familiarity with the basics of the sciences. If one gets tangled up on astronomy, for instance, I suggest reading the first few chapters of a college text on the subject. That should provide everything the reader needs to know. I also, unfortunately, put asides into my footnotes on occasion, since I find it is no fun at all to write if I stick to the subject.

² Cited in Radin (1937) 64-65.

³ For preliterate thought, a most interesting treatment is Radin (1927), (1937). See also Wilson (1970) and Malinowski (1948).

ultimate reality they find behind the behavior of everyday things. Instead of a machinery of atoms and physical forces (which *we* generally take no note of), they find spirits endowed with desires, perception, plans and actions, all the elements of psychological explanation. Where a full blown spirit is not behind events, there may be a semi-personal, even unconscious power, originating in a spirit, but now transferred to another spirit's control, or even functioning autonomously. So the Great Spirit provides the power by which we move our bodies, and reclaims that power when we die, and the power of a chieftain may infect his food, rendering his leftovers dangerous to the less powerful, or a disease might be traced to an ancestral spirit angered by a breach of kinship morality.

How did the spirit theory become established? People would naturally light on explanations in terms of personality when asked what lay behind a thing's powers or activity, for those well adapted as social creatures tend to perceive things in social terms, and so we act as if we are dealing with persons sometimes even when no persons are present. We are especially likely to react emotionally to events as though people were behind them, when in fact they aren't, and emotions carry with them beliefs (or at least a tendency toward beliefs), a reading of the world justifying the emotion in question. If we become angry at stumbling over a tree root, we might well assume that the spirit of the tree somehow deliberately tried to trip us up. Moreover, one often sees people in dreams and visions, which it is natural to interpret as a second reality outside the waking world. Dreams of dead people might lead one to take the image as what gives people life and activity, and is drawn out of them in sickness, sleep, trance, or death. Once such shadow souls are conceived, one might seem to encounter them in plants and animals, and whatever else moves of itself. And surely some such shadow souls would be without physical bodies, for instance, the souls of one's ancestors. Perhaps some never did have bodies.

When one sees into the truth, she generally tries to take some advantage of the insight if she can—theory generates technology. The spirits would, of course, form an organized society. They would have kinship relationships, and related spirits would enjoy a mutual sympathy, so that what affects one will affect the others. These kinship relationships lie behind a certain kind of magic. A particular kinship group would be put in charge of certain magic rituals because the group concerned, and the animals, plants or other targets of those rituals, were thought to share a common ancestral spirit. So one may belong to the turtle clan, and be required to participate in magical ceremonies reenacting the turtle ancestor's story, in order to increase the number of turtles and make them easy to catch.

Magic is usually less a personal interaction with the spirits than a technology rooted in the notion that

pre-enactment of a desired event, using something with which the target is in sympathetic, spiritual contact, can bring about the event. So one may, after praying to the Deer Spirit, shoot an arrow into a deer trail, thus making the deer likely to be shot in tomorrow's hunt. Such magic won't help anyone who is a bad hunter to start with, but it may help a good hunter avoid ill luck or get some other advantage. The sympathy between deer and trail might be traced to the deer frequenting it, so that traces of the Deer Spirit are to be found all along the trail. Or one might seek out a member of the Deer Clan to play the deer in the ritual rehearsal of a successful hunt.

Surely people should have realized this technology does not really work? Well, often it *does*. In medical matters, suggestion can work wonders not only in dealing with anxiety and depression, but even with physical diseases. Those who are suggestible have an advantage over those who are not in a society in which ways to address the physical causes of illness are largely unknown, and in the face of a world well adapted to produce acute anxiety or depression, and thus suggestibility has become a normal, and desirable, feature of human beings. For this reason the medical practices of the Shaman, relying on his supposed relations to the spirits, are often quite effective, whether there are spirits or not. Again, decisions must often be made under conditions of uncertainty in which it is difficult to bring ourselves to act, aware as we are that the outcome of any particular action is incalculable. But decisions need to be made, and a strategy of no decisions is far worse than decisions based on guesswork. So one will have an advantage if he takes recourse to the spirits, using divination to learn from them what is going on and what must be done, and if a certain amount of irrational faith and self-deception is needed to do that, those given to such faith and self-deception will do better in the world than the more rational skeptic.⁴

One metaphysically robust theory of magic found in many preliterate cultures, as well as the mythologies of Ancient Egypt and Mesopotamia, takes some spirits to inhabit more than one individual. Coyote, say, would be considered a single, independent reality found in all individual coyotes, and in whatever has the powers characteristic of coyotes, and perhaps in the members of the Coyote clan. Some cultures postulate a single power behind the world as a whole, dwelling in all things, the source from which other spirits and powers draw their being. This supreme spirit typically leaves most of the affairs of the world to lower beings, and in pre-civilized cultures one does not usually seek its help. The order people find in the natural world generally mirrors and justifies the order of their society, so cultures lacking a centralized political order

⁴ For these points and related ones, see Dennett (2006).

usually view the lower spirits of nature as capricious things only sometimes interested in the good of the whole, and just as often interested in self-assertion, their own welfare, or practical jokes. They will view the highest spirit as a distant parental figure, interested in the welfare of the whole, but remote from the everyday affairs of human beings for just that reason. In a civilized culture, with a supreme ruler supposed to be interested in the welfare of the people, a benevolent supreme spirit with an interest in justice will be postulated, and the evils in creation will be attributed to conflicts and incompetence among the lower spirits, just as the evils in the Kingdom supposedly arise from conflicts and incompetence among the administrators serving the King. The organization of the spirit world reflects the organization of the society dealing with it, and where there are Kings and nobles, there are Gods.

The ancestor-spirit and the common-spirit theories usually coexist, and so Coyote, or an Egyptian God, will be viewed simultaneously as an ancestor and an existing spirit to be found in each thing with the powers and characteristics of Coyote or the God. The result may look inconsistent to us, but it is best not to make too much of this. For one thing, the Neoplatonists,¹ perfectly civilized philosophers, faced similar inconsistencies explaining how their eternal, unitary, spiritual being could give rise to a temporal, passing, partly material, world to which it was supposed to be identical. The inconsistency is usually apparent to the culture's intellectuals, who have some way of resolving it. The intellectuals' resolution might appear scandalous to a layperson, of course, since it takes some ordinary belief to be metaphorically, but not literally, true. Such notions may be kept secret within, say, a guild of Shamans. The adherents of myth handle apparent absurdities in their world view the same way we do. They refer the question to experts, who often turn out to be heretical, though the heresy, if suspected, is tolerated in them because it is thought that an ordinary fellow cannot really understand or judge their esoteric notions.²

But magic is something more than technology—it also helps us control debilitating emotional responses. Human beings are far more anxious about events than most animals since they spend so much time anticipating what may happen. They live in continual awareness of an imagined future, and in memory of a disturbing past, while animals with less in the way of rationality and language live much more in the present. So when a human being anticipates a bad event, and, casting around for a way to prevent it, finds none, she often becomes obsessive, imagining the event over and over in a desperate attempt to find a way to make it

¹ For the Neoplatonists, consult Chapter 12 below.

come out right. This is dysfunctional, of course—other things need her attention, the stress involved is damaging . . . but even if we recognize this, it is not easy to modify our emotional reactions to rational specifications. So we turn to magic, and, once the ceremony is done, feel relieved now that *that's* been taken care of.

Or we might turn to mythical belief. Beliefs not only guide behavior, they also affect our emotions, because emotions prepare us for what we believe we have to deal with, anger when we need to meet a challenge to our social status, fear when facing danger, and so on. We control emotions with beliefs—if we can't simply believe by ourselves on cue perhaps others will tell us stories to reassure us or motivate us, and we do tend to believe what others say. We reassure one another with myths that treat the world as human, a place we can understand and control, through our instinct for fruitful personal interaction if by no other means. In general, beliefs that function to control our tendency to emotional over-reaction are well defended against possible empirical refutation. They are too important to lose to mere evidence, and as long as they are only used to guide our emotions, or to suggest emotion-guiding actions that do no harm (it can't hurt to pray, we say), it doesn't matter if they aren't true. And besides, one can defend the literal truth of the story, as it can be supported by dreams, visions, cures and other pieces of observational evidence, and perhaps by other arguments as well.

One function of this sort of pre-literate world view was to reconcile people to the evils in the world, evils that threatened to throw them into despair at living inescapably in a world that, unlike the social environment they were emotionally designed to seek, cared nothing about their lives or welfare. Evils arose, as it turned out, because the various spirits, including human beings, had opposing interests and inevitably came into conflict with one another. The world was not an uncaring, impersonal place, but a place in which evils need not occur as long as the spirits can get along with one another, and in which one who suffered apparently inexplicable evils might blame himself for his pride, lack of consideration, or whatever else contributed to his inability to get along with the other spirits. Wisdom consisted in respecting the needs and views of others, and knowing how to get along with them, how to get what one needed from them without arousing conflict, in short, in the qualities necessary to do well within the social order. A wise person would do all right in the world at large, for it *is* a social order. The Shaman had to learn this wisdom, and extend it from the human into the spirit world.

It might be recognized that some serious evils were unavoidable even by the wisest of human beings, of course, but even these evils were not attributed to an oppressive or uncaring personal agency. They were

thought to follow directly on the underlying nature of spirits and human beings. Human beings were generally viewed as composite beings, joining a number of different spirits of different sorts within them, and death resulted when the composite came apart again, the life force returning to the higher spirits from which it had come. The question why things were that way was not raised, or if it was, it was assumed that the natural background to the social order could be of no other kind. Moreover, the world view accepted in a pre-literate culture often suggests that death is not as bad as might be supposed—even death can be overcome if one is wise, for life for one's spirit continues in another world, a world visited sometimes in dreams and visions.

2. MESOPOTAMIA

... She is sovereign, she is the lady of lands,
In the Apsu of Eridu [the primeval waters] she has received decisions [i.e. authority].
Her father Enki has given them to her,
The high-priesthood of kingship he has put in her hand.
With Anu, in the great shrine, she has set a dwelling,
With Enlil in his land she fixes destiny.
Monthly at the new moon, in order to make proper the divine order,
The gods of the land assemble before her.
The great Anunna do reverence to her,
My Lady pronounces the judgment of the Land in their presence.

Ancient Sumerian hymn to the goddess Ishtar³

We find a systematic world view already in the very earliest records of human thought, the written documents of the first civilizations in the great river valleys of Egypt and Mesopotamia. These valleys became so crowded, due to progressive desiccation of the surrounding territory, that their people could support themselves only with ever more intensive agriculture. In most preliterate cultures, even after the invention of agriculture, a clear class structure does not form. Perhaps the difficulty is the need to mobilize nearly the whole male population when warfare breaks out. This makes it impossible to restrict the warrior class to a small portion of the population if destruction by one's neighbors is to be avoided.⁴ Moreover, before it becomes

³ Cited in Saggs (1962) 318.

⁴ It has been suggested that a group could easily pull up stakes and move on if it loses a military contest. Generally, it has been thought, land enough is available, and the material culture is portable, or easily enough reproduced elsewhere. But Keeley (1996) provides considerable evidence that warfare often arises in preliterate societies due to population pressure and limited resources, and so it seems the easy movement to new territories in a state of primitive abundance is a myth, and losing can be a real catastrophe. The myth is probably due to the impression that the resources available are under utilized, but, of course, they will be as fully utilized as

profitable to reduce captured enemies to serfdom, technology must reach a stage in which single workers can produce significantly more than their own upkeep. Victory in preliterate cultures, then, typically led not to conquest, but to simple massacre, which would free up natural resources for one's own tribe, though some of the enemy's women and children might be adopted to replace losses. In any case, there are rich and poor in pre-civilized societies, but not nearly as great a distance between them as we are accustomed to, and the rich do not, as they do among us, typically live on the forced labor of the poor.

The fertility of Mesopotamia and the valley of the Nile enabled a single laborer to produce a large surplus beyond his own upkeep using the new agricultural technologies, and the desert at the edge of the river valley supported only a very low population density, and so provided very little military threat. Combat with other civilizations occurred at first on a narrow front, fighting upstream or down, moderated by the requirement that reserves be held in place to forestall peasant revolts. Moreover, the river provided sufficient means of communication and transportation to allow the formation of unified polities of some size. So once technology made it profitable, some were conquered by others and forced to remain in subjection, a relatively small army being sufficient to defend the state. A new kind of power was abroad, political power, but it came only only to those needed to defend the state, the conquered became peasants, forbidden to learn the military arts, and the conquerors became overseers, priests, and lords, and, soon enough, the wealthy, so that they could take advantage of yet another source of power. For the first time there were rulers and ruled, and social classes took form. In the old, pre-literate days, what government there was only occasionally intervened in people's lives, to prevent the outbreak of ruinous conflict. Now there were laws, courts, governmental authority, debtors and creditors, and a standing army enforcing the whole system. The new political arrangement greatly increased the efficiency of agricultural production, and the state became indispensable to the vastly increased populations that grew to match the new, enforced productivity.⁵

The new order required justification in the face of the complaints of the oppressed, for things worked best when the lower classes cooperated more or less willingly with the upper classes, and the upper classes felt most comfortable when sure that their privileged position had good reasons behind it. Myth traditionally

possible given the primitive technologies available.

⁵So Zolberg (1981) and Giddens (1985), somewhat altered here by my own reflections.

justified social arrangements.⁶ Since people always think the spirit world to have the same social structure as their own world, among the spirits some came to be regarded as gods, who enjoyed military supremacy, had authority over the rest, and formed a royal family, living in wealth in a royal dwelling. Mesopotamian priests explained that the gods had produced the world, and made men to till the land and provide them with food through sacrifices, assigning the King and his government to manage the land. A marriage between the local goddess and the King, celebrated in an annual festival, generally certified the arrangement. The King was not himself divine. Among the gods, things had happened much as they had among men. The current rulers were latecomers, who had conquered and slain their predecessors, although the conquered remained, and provided the fertility of nature, for the world was made from their bodies.⁷ Originally a wise old man headed the Gods, but he had to step aside in favor of the vigorous young warrior who overcame the older Gods in the pitched battle that established the current world order. The Gods, unlike the anarchic collections of spirits typical of pre-civilized peoples, formed a political order, an organized pantheon, a military caste, and the mythology reflected political events such as the conquest of one state by another. So the Goddess of a conquered state might be said to have entered a forced marriage with the conqueror's God, with its consequent transfer of property. Arrangements on earth mirror the arrangements among the Gods—reasonable, just, beneficial, well-meaning arrangements. The world itself demands these political and social arrangements. We are all, aristocrats and peasants alike, trapped in a world of death, disease and other misfortunes that the Gods do not experience. Human aristocrats try to provide a little security for everyone by organizing production, meeting our duties to the Gods, and defending the state against foreign attacks. If they receive certain privileges, it is only reasonable that they should, given their service to the community. Without the aristocrats and the discipline they impose things would fall apart. The Gods themselves care for the people, but they demand service, and have their own problems. One cannot expect too much from them, and must not ignore their gift of government and justice. Indeed, the highest God is generally the God of Justice, for justice befits the King of the Gods, and supernatural sanctions for morality assume a much more prominent place in the religions of civilization than they do in the pre-literate societies from which civilization evolved.

But at the same time Mesopotamian religion gave rise to thinkers who recognized that the world is far

⁶ For Mesopotamian mythology, see Henry Frankfurt (1946), (1948). Kirk (1970) is an excellent account of ancient mythology in general. For texts, see Kramer (1944), (1961), and Pritchard (1957).

⁷This is intended quite literally. The elder gods identified in the Mesopotamian myths represent natural forces, the fertility of the moist, but also the mass of moisture itself, for instance.

from ideal for human beings. The *Epic of Gilgamesh*, a very early Mesopotamian poem read for a thousand years or more, one of the oldest religious documents we possess, recounts the failing quest of its hero for immortality, a quest undertaken in defiance of the gods, and his final bitter recognition that he had to be satisfied with the limited good of a human life, the result of our subordinate place in the world. The poem views humanity as peasants made from the earth by the Gods for their use. To make them live, the gods breathed their own breath into them, thus ennobling them and putting them at odds with nature, just as the gods, who had conquered nature when they defeated the elder generation of gods, were at odds with nature. And the breath of the gods in them gave rise to yearnings human beings can never fulfill. Ineed, the breath of the Gods in them makes human beings threatening to their own creators, so that the Gods take deliberate steps to keep human beings subordinate in a life of suffering and toil. There is no hint that some higher morality, espoused by some higher God, might expose the arrangement to criticism. If human beings are made by the Gods to be used for their purposes, doomed to hard work, sickness and death, well, we should be grateful we were made in the first place, and only a fool would complain about the Gods' treatment of him, given that nothing he can do can avails against them. One wouldn't want to make them angry. In the same way, the peasant has no complaint coming if he is impoverished and overworked, and should be grateful for his Lord's attention and favor, allowing him to work the Lord's land, for instance, however limited that favor might be. The peasant has no right over against the nobles, just as human beings have no rights over against the Gods.⁸ But that does not mean a wise peasant will not look upon his situation with a certain wry recognition of its unfairness. He will see that he is made from the same stuff those running the place are, and if he must settle for little, and even give over any right he might think himself to have to more, to avoid violent retaliation from those ruling the place, that does not mean he does not wish for or even deserve more than is his lot, or even that he might not be a better person than the ruler who oppresses him, even if he dare not say so.

3. EGYPT

Praise to you, O Osiris, Lord of Eternity,
King of the Gods...
Great One, First of his brothers, Eldest of
the Primeval Deities,

⁸For the further elaboration of this Mesopotamian world view, the reader might turn to Book IV, Chapter 1, the discussion of the Hebrews, who developed Mesopotamian thought further, and passed the resulting world view down to the Jews, Christians and Muslims in the Hebrew *Bible*.

who established Maat [Justice, the Law] throughout
the two banks of the river,
who put the son upon the seat of the father,
whom his father, Geb, favors, and his mother, Nut, loves,
great of strength when he overthrows the rebel,
mighty of arm when he kills his enemy,
who inherited Geb's kingship of the Two Lands.

Hymn to Osiris, about 1550 BCE⁹

The myths of early Egypt took a somewhat different turn,¹⁰ for they insisted that the Egyptian king, the Pharaoh, was himself a god, not merely a vassal or consort of a god. Indeed, he was the most powerful of the gods. Very early on the Pharaoh even used magic to compel the other gods to his will. Later Egyptians viewed Pharaoh as an embodiment of Re, the Sun God, and, inasmuch as he is the son of the previous Pharaoh, they also viewed him as an embodiment of Horus, the son of Re. He took on the character of Re himself when he went in to his wife, so that his successor too, was Horus. Upon death, the king became Osiris, the god of the underworld, who is, once more, Re, but Re in the afterlife, visited nightly in the underworld by Re, the Sun God proper. The privilege of an afterlife could not long be restricted to the kingship, and in later dynasties, first the nobles directly under the king, and at last anyone who could afford the right ceremonies, would be identified magically with the king, become an "Osiris," and lead an afterlife as a subject of King Osiris in the underworld.

Modern scholars have reconstructed Egyptian mythology from the ritual of Kingship, and it is quite thoroughly adapted to the exaltation of the Pharaoh. The various mythical traditions found within the Egyptian empire and blended into this ritual, lose their individual character in the mix.¹¹ Unlike the Mesopotamian tradition, which is rooted in a recognition of the plight of those at the bottom of the social order even as it defends that order, Egyptian mythology gives no comfort at all to a would-be rebel. It provides the hope of immortality to all, unlike the Mesopotamian world view, but at the cost of regarding any dissatisfaction with the order of things as perverse and unnatural. Any failure in the political system is attributed to the failures of

⁹ Cited in Anthes (1961) 83.

¹⁰ For Egyptian mythology, see Henry Frankfurt (1946), (1948), Anthes (1961), and Clark (1963). Lichtheim (1973) is not only an excellent collection of sources, but includes first-rate discussions of the background and meaning of the pieces it translates.

¹¹ Kirk (1970) 207-209.

its officials, not the system itself or the Pharaoh, and they must vouch for their good behavior to gain a good afterlife.

This mythical system takes advantage of the ancients' identification of their gods with the powers they represented, so that the gods could be said to be identical with, or to dwell in, whatever displayed the power in question. The Sun's power is that of the all-surveing ruler, and so the King *is* Re on earth. Egyptians, Mesopotamians, Greeks, all ancient peoples regarded the gods more or less in this way, but the Egyptians especially so, to the extent that they usually saw various divinities within one thing, and provided several accounts for the same event. An Egyptian might, almost in the same breath, refer to the sky as the belly of the Cow, Hathor, the plumage of Horus, a hawk whose eyes are the sun and moon, or the Goddess Nut, separated from her husband, the earth, by Shu, the god of air, or a sea through which the boats of the sun and moon sail. These easy contradictions emerge in part from a respect for originally independent traditions merged within the unified Egyptian state. The growth of empire, welding together a number of different subject cultures under one ruling authority, led to a merging of traditions, which was far more politic than the imposition of one tradition and utter denial of the rest. This initial merging in the earliest empires led to the melting together of gods with the same function in the different cultures, and gave the function a life of its own. But also, to bring everyone under the same religious umbrella, it was necessary for the Egyptians to avoid taking their myths quite literally, and so they saw not inconsistencies where we literal-minded heirs of science see them, but different, more or less poetic accounts of the same thing. Perhaps the core of each story is true, so that it would make sense for us to search out how the myths all agree, and come up with a literally true account, but then the account would be very thin and uninformative, and really no fun at all. Or, if we find ourselves committed to myths different enough from one another, we might even say that we cannot describe the situation in literal terms, due to our lack of knowledge or the limitations of our experience, but the many myths, approaching it from all sides, are a way to express it. In any case, the truth, however it actually goes, is such as to support the attitudes and practices the myths support. There is some kind of authority in control of things that supports the authority of the government, say, or some power that is benevolent toward us. Such intellectual maneuvers were required to keep everyone on board in the universal cult, whatever their local background. By the 6th century BCE, all the various gods in Egypt had begun to melt together, all regarded as manifestations of the same, mysterious, indescribable universal power. The final stages of this movement are seen in the cult of Amon, the "hidden one," that is, the hidden power behind all things, and behind all the other gods. Amon cannot be conceived or imaged, and the lesser gods are aspects and powers of this single,

all-encompassing, barely conceivable deity whose substance forms the heavens and the earth. This is a direct outcome of the requirement that a large variety of people with very different conceptions of the matter should all live together in the same organization and the same ostensible beliefs. If our King, descendent of the Lion Ancestor, were to be regarded by some, after we conquer them, as the Associate of the Great Turtle, or the Embodiment of the Breath of the Sun, we might choose to regard *all* of these stories as true, making fun of the lack of sophistication in those rationalists who insisted on finding them contradictory to one another and questioning their truth. Indeed, to argue that *some* are false threatens to set up standards for truth that all might fail to satisfy.

4. IONIA AND THE POLITICAL BACKGROUND TO PHILOSOPHY

You inhabit a Greek land and understand our ways,
How to live by law instead of the sweet will of force.

Euripides, *Medea* 537-538¹²

Our earliest evidence of the battle of world views from which Western philosophy arose comes from the Greeks of Ionia (now the west coast of Turkey) in the 6th century BCE.¹³ The Greeks preserved an ancient world view in Homer's great poems, the *Iliad* and the *Odyssey* (8th/7th century BCE), antiquarian collections of old myths such as Hesiod's *Theogony* (8th century BCE), and the traditional ritual of religious life. But in such places as the vigorous trading center of Miletus, Ionia's most populous and powerful city, the mother of more than seventy colonies scattered from Egypt to the Black Sea, new political realities had rendered that world view obsolete.¹⁴

The central myths of the Mesopotamian and the Egyptian priesthood justified and supported the rule of the King and his nobles and priests. In the early days, it was so in Greece, too, where, despite influence from the more anarchist North, the pantheon, inherited from a Mycenaean culture native to the Eastern Mediterranean, remained a household of conquering warriors very like that of the Mesopotamians. Homer tells

¹² Translation by Rex Warner.

¹³Philosophy arose not only in Greece in the West, but independently in India, and China, as well. It does seem that philosophy and science arose only in urbanized trading cultures in which the political power of a more or less exclusively military caste with its priesthood had been undermined, the aristocrat being replaced by the citizen-soldier.

¹⁴ For the political history of early Greece, see Fine (1983), Chapters 2 and 3.

us that Zeus supports the rights of kings, and it is clear that the king is bound formally by no law, however unwise it may be for him to defy the rules laid down by the gods, violate customary standards of behavior for Kings,¹⁵ or to ignore the welfare and expectations of his subjects.¹⁶

The Greeks were a people in movement, entering the Greek peninsula from the Indo-European homeland to the Northeast in the 10th and 9th centuries BCE, and becoming sea-farers, a trading people, as soon as their migration brought them to the Mediterranean. In part, their overseas colonies continued the migrations. In part, trade and colonization was a natural solution to overpopulation at home, since the mountains of Greece were not very good for grain, but well suited to olives and grapes, and the oil and wine could be exported. The mountains cut the Greeks up into many independent, easily defensible states, fostering cultural creativity much as islands foster the evolution of new species, while the omnipresent sea ensured contact with a wider world. In particular it ensured contact between Greek and Greek, colonies maintaining association with their mother cities, leagues and confederations meeting at annual games and religious festivals in central locations, and all Greeks together meeting at Olympia for the games, and at Delphi to consult Apollo's oracles. Trade and colonization also meant contact with the Eastern Mediterranean cultures—the influence of Egypt is apparent in early Greek sculpture, while the Greek alphabet came, apparently in the early 8th century BCE, from the Phoenicians on the coast of Syria, another trading culture equally in need of efficient record-keeping. Though Views of the afterlife and a great many mythological motifs found in Homer and Hesiod are characteristic less of the Greek Indo-European homeland than they are of the Eastern Mediterranean. They were the views of the original inhabitants of the land, whose Mycenaean culture was developed ultimately from the cultures of Mesopotamia and Egypt, or borrowed directly from trading contacts with Syria, Persia, and Egypt in more recent times. The invaders from the North were anxious to learn from their more cultured neighbors, but they always introduced a difference into what they learned. The early sculpture modeled on Egyptian statues quickly developed into something different and remarkable in Greek

¹⁵The King was regulated in his actions, much as everyone else was, by customary rules and expectations, many of which may well have achieved the status of laws, even if they were never “legislated” by any body with authority to limit his actions as it saw fit. If he violated the customs in ways that bothered people, he might well accumulate enemies, and even get himself killed. Agamemnon was killed by his own wife for behavior too autocratic and selfishly neglectful of his family's welfare, when he ordered the sacrifice of his daughter to the gods, to achieve favorable winds for the voyage to attack Troy. This happened even though it seems to be agreed that he had the authority, as King and military leader of the expedition, to perform that heinous act. Indeed, there would have been times and places where such an act would have been expected of him, for the benefit of the larger community in the face of hostility from the Gods.

¹⁶ For an insightful brief account of law as it occurs in Homer, see Jones (1970) 2-6.

hands, and the Phoenician alphabet gained new symbols for the vowel sounds, as well as being turned to new uses, for the Greeks used writing from the beginning to preserve their poetry, something the Phoenicians did not do).¹⁷ The Greeks exhibit an altogether remarkable genius, which cannot be entirely explained by any general consideration, but it does take on the character of innovation by a less sophisticated people intruding on the scene of a more advanced civilization. Anxious to adopt the attractive inventions of older civilizations, they see them from their own point of view, adapt them to their own uses, and, free of the traditions in which they are embedded, develop them in their own way.

The mythological borrowings of the Greeks were in fact ill-adapted to their original ideological purposes in their new environment. Greece in the 6th century was no longer a land of kings. A new political design, that of the city-state, had taken the place of kingship. Around 1200 BCE the Mycenaean kingdoms collapsed before the invaders from the North, and the prolonged disorder that followed undermined the power of kings even in the small and barbarous successor states established by the newcomers. The complex infrastructure of the cities collapsed, and they were abandoned for life on self-sufficient farmsteads. With deurbanization, the bureaucratic infrastructure headed by the king collapsed. The kings of the successor states, no doubt on the model of Indo-European institutions originating outside the Mediterranean, were military leaders, whose authority could be asserted only in time of war, while real day-to-day power lay with the aristocratic families that controlled the land. A state consisted of a loose federation of aristocratic clans who banded together to form an army in military emergencies, and recognized the nominal authority of a king, leader of one of the clans, who dwelt in a central citadel where all could take refuge. Over time, cities grew again and the old economic complexity returned, but the new bureaucracies were not directed by the kings, but by aristocratic assemblies of fighting men, which developed directly from the annual muster of the army itself. In early assemblies, the citizens sometimes met under arms. The king had no resources beyond his status as a clan leader to withstand the majority of the clans in such an assembly—sooner or later natural shifts in political power would leave him without influence. But his religious function was strictly hereditary, and it did no harm to allow his clan to retain the office once it was stripped of military power. The king's role became, in the end, merely ceremonial—he performed the sacrifices.

¹⁷The Phoenician letter forms, order of the letters, and names of the letters were all adopted by the Greeks, at first without change. Vowels were introduced due to creative misunderstanding. The adoption was enormously successful, and the Greek alphabet spread with Greek commerce. It is the basis for the Latin, and other neighboring alphabets. The adoption entailed the abandonment of a Mycenaean script that had survived at Cyprus. See Burkert (2008).

In the 8th century, the new government by aristocratic assembly, with continuously shifting power in the hands of competing aristocratic families, underwent further alteration due to a new military technology. Fighting on land came to rely on heavy infantry, massed spear men maneuvering in phalanx, rather than the cavalry or chariots of the aristocracy, and fighting at sea came to rely on masses of rowers to accelerate a warship to ramming speed, rather than boarding and hand-to-hand fighting. With these developments the city had to admit a much larger portion of its population into the army and navy, and to be a warrior one no longer needed sufficient wealth to keep a horse and chariot. Indeed, though the heavy infantry were almost always land-owners, an oarsman typically was not, for he needed no more wealth than was necessary to buy a cushion and some leather thongs, and, of course, to devote time to training, though for this he might receive pay. With their new military role political importance came to the lower classes and to new families, for men who can fight and are needed in the army have to be given political power. Such men can make trouble, threatening revolution, or refusing to fight when the state is threatened. Moreover, with the rise of urban manufacturing and the increasing organization of trade, ownership of the land became less and less important as a source of wealth. A new political order replaced the aristocracies, an order in which the various classes were represented in complex interacting structures of councils and courts. The law, once the secret property of the aristocrats, was published for all to read, and judicial councils were recruited from the general population. Nonetheless, the old privileged classes remained important, since their young men, trained in a long tradition of public service, continued to be wealthy. They served in the cavalry or paid for the construction of warships they might then command. But most states also included as full citizens a large middle class of foot soldiers, and, if a navy was wanted, a large lower middle class of sailors as well. It was the seaward states such as Miletus that experienced the greatest changes, for they had to extend citizenship further than did land-based states such as Sparta.

What stood out for the Greek mind in these new city-states was the necessity of balancing the interests of the various classes, granting to each what it most wanted and needed, and to each power consonant with its military contribution. The structure of these new states informed the world view of those we usually identify as the earliest Greek philosophers.¹⁸

¹⁸For the political/ideological character of early Greek science, see Vernant (1982), Vlastos (1947), (1953). For the roots of Greek speculation in mythical and religious thought, see the works of F.M. Cornford (1926), (1952).

5. THE NEW POLITICAL SCIENCE

. . . listen now to right, ceasing altogether to think of violence.
 For the son of Cronos has ordained this law for men, that fishes and beasts
 and winged fowls should devour one another, for right is not in them:
 but to mankind he gives right which proves far the best.
 For whoever knows the right and is ready to speak it,
 far-seeing Zeus gives him prosperity; but whoever deliberately lies
 in his witness and forswears himself, and so hurts justice
 and sins beyond repair, that man's generation is left obscure thereafter.

Hesiod, *Works and Days* 274 ff.¹⁹

Our city never will perish according to the decree of Zeus
 or the will of the blessed gods immortal.
 For such a great-spirited guard holds her hands protectingly above it,
 Pallas Athena, she of the mighty father.
 Rather, the townsmen themselves, in their folly, wish to destroy
 our great city, persuaded by wealth,
 and unjust is the mind of the leaders of the demos: for them
 many grievous sufferings are certain, the fruit of their great *hybris* [overreaching].
 For they do not know how to suppress *koros* [excess] or how to conduct the present
 joys of their feasting in decorous fashion,
 but instead they grow rich, putting their trust in unjust deeds.

Solon of Athens, Fragment 4.²⁰

Kingship was dead long before the 6th century, when the Ionian philosophers began their work, but that is not to say that there was no conflict of political ideologies. Some favored oligarchical rule, restricting power to the old noble families as much possible, and others democratic rule, extending power to the lower classes. Early on, democratic aims were generally accomplished through “tyranny,” that is, the rule of a single person, an opportunistic (and sometimes idealistic) member or family of the old aristocracy, who blocked the way to office and power for the others of the old nobility, while pandering to and drawing support from the lower classes. Tyrants would generally construct large public works to assure full employment, enforce forgiveness of debts and redistribution of land for small farmers, and the like, defending the poor from

¹⁹From *Hesiod: The Homeric Hymns and Homericica*, translated H.G. Evelyn-White (Harvard University Press, 1926). Compare *Works and Days* 225 ff.

²⁰ Translation by John Porter, url: /homepage.usask.ca/~jrp638/DeptTransls/Solon.html (November 2009).

exploitation by the wealthy oligarchical families. They were most frequently found in maritime states, and their establishment of navies to defend commerce from piracy and undue competition from other commercial powers aided the poor and the commercial classes. It also increased the tyrant's clientele by bringing the poorer classes into the military, as oarsmen in the triremes, and so into the assembly. Tyrants, and later, democrats, were opposed not only by oligarchical forces within the state, but also by oligarchical exiles working to regain political position for their families. Such exiles would congregate from various cities in oligarchical strongholds, and came to view one another as allies, fellow oligarches, no matter their differing citizenship. Thus there arose conflicting ideological loyalties to supplement loyalties to one's city-state. By the 5th century the common enemy of the oligarches was democracy, which had been established in many states after the expulsion of the tyrants who, although they broke the power of the aristocratic families, proved themselves, in the end, an equal threat to the equal exercise of political power by the people. The tyrannic program of land redistribution dropped from the democratic agenda, and the toleration of wide divergences of wealth in the state reconciled the more conservative elements to democratic rule in many places. The justification of democratic rule was based in the observation of the political consequences of democratic and opposing policies. No one argued that Zeus and the gods favored democratic rule. Rather, the democrats argued that democratic rule, meaning political equality of all citizens, rich and poor alike, with universal access to the military service that underlay and justified the political standing of the citizen, was essential to internal peace and military strength. The natural outcome of oligarchical policies, they claimed, was revolution and tyranny, or an oppressive regime maintained by force that reduced the small landowner to virtual slavery.

The oligarchic party clung, at first, to the old religion in response to the naturalistic arguments of the democrats. They favored the rule of the "better" people (or rather, the better families), the *agathoi*, with the poor keeping their place, and they preferred the authority of tradition to reason and reform, of absolute ethical values not to be questioned or defended by any naturalistic strategy.²¹ These values were based in divine authority (like the old laws of the aristocracies before people took to writing laws down and legislating them), or the intuitions of the *agathoi*. They objected to the undermining of loyalty to the family by the state, a theme one can observe, for instance, in the tragedies of Aeschylus. They looked to the old order of things, and

²¹In general, something *agathos* is useful because it serves its function well, as in an *agathos* axe. So the word translates for the most part quite handily to the English "good," as in a *good* axe. In contrast, a *kalos* axe would be noble or admirable, good, but not in virtue of its usefulness, so perhaps "beautiful" or "fine," the usual translations. See Plato's *Greater Hippias* for the distinction between these terms.

despised the new views of the Greek Enlightenment. Later oligarchic views received support from the new science, once it had been adapted to the defense of a religious view of the world—the Pythagoreans and Plato argued that Good ruled the world, and, parallel to this rule, the *agathoi*, the few who understand the good, should rule the state. The democrats saw natural political processes, but no rule of the Good, not a harmony imposed from above, but a balance arising naturally from the play of conflicting forces.

However, the wiser heads among the oligarchic forces, early on, at least, were capable of employing naturalistic views in designing a policy to avoid the rise of tyranny. Most notable, standing at the beginning of what we know of affairs in Athens, was **Solon of Athens**,²² who was of excellent family, and served the city well with his good advice in time of war. He was elected Archon in 594/3 in the hope that he could mediate a developing civil conflict, which threatened to eventuate in a tyranny. So, contemporary with the activity of Thales, the first of the new naturalistic thinkers we shall be depicting, Solon instituted a number of reforms in the Athenian constitution. He then, so the story goes, left to travel abroad for ten years, after obtaining everyone's agreement not to alter any of his laws without his express permission (which could not be given since he was not present). His measures received a fair trial, but failed to prevent the rise of the tyrant, Pisistratus, in 561, and his return, once expelled, in 546. Nonetheless, Pisistratus did not alter Solon's legal and constitutional reforms. In the 5th century the democrats came to think of Solon as the founder of their party. It is more accurate to view him as a moderate oligarch, anxious to prevent the rise of tyranny, with some sympathy for the poor and dispossessed, or perhaps a representative of the emerging merchant class, impatient both with the old aristocracy and its interminable feuds, and with the small farmer's constant agitation for debt relief and new land distributions. His legal measures aimed especially at freeing those who had fallen into slavery due to their debts to wealthy land owners, and preventing debt enslavement in the future by outlawing the use of land as security on a loan. He fought shy of a redistribution of land, but not, it appears, of cancellation of existing debts.²³ Solon thought wealth came to one by the allotment of fate, and saw no injustice in some people being more wealthy than others. He wanted the city to avoid the injustice that resides in denying the rights of the poorer citizens, but equalization of wealth was no part of this program, and the poorer citizens were expected to accept their poverty. Indeed, Solon seems to have established the system by which qualification for public office depended on income alone (presumably, *not* on one's nobility of ancestry, but

²² For Solon, see Fine (1983) Ch. 7, and Vlastos (1946).

²³ Vlastos (1946).

also, unusually, not on accumulated capital).

With a much broader and more effective access to political power, and institutions guaranteeing the continuance of this access, the democratic party later adopted Solon's policies. But in the 6th century neither oligarch nor democrat was satisfied with his half-measures, and, when his policies were abandoned, the tyranny of Pisistratus came anyway. The state was stabilized only in the following century, when the small peasant and the landless were finally provided with a secure livelihood, and enough of a stake in the society so that they no longer sought its radical reformation, but this occurred not through land reform, but rather through the growth of commerce and the revenues of empire. Solon himself sought economic reforms, building local industry and fostering the growth of Athenian exports in olive oil, but these were aimed at strengthening the state as a whole. Even if they had in mind assistance to the poor, such measures were not conceived as an antidote for injustice. Rather, Solon saw that Athens could not afford to reduce the numbers of its potential recruits, especially in the navy, by enslaving the independent small farmer, making him ineligible as a soldier. The Spartans were already visibly falling prey to this danger through their conquest of neighboring states, and drifting into an oppressive political arrangement in which the army, however skilled it might be, was limited in numbers by the limitation of citizenship, and tied to its home country by the need to hold down a large and hostile subject population.

Herodotus viewed Solon as a *sophos*, one of the new brand of secular experts qualified to direct the state due to his deep theoretical knowledge of the real nature of things, and this is not far from Solon's view of himself. When we examine the remaining fragments of Solon's poems, we find what would later be identified as Ionian naturalism applied to politics. He rarely mentions the gods, and certainly never gives divine sanctions as a reason to follow a policy. This sets a contrast to the earlier Athenian legislator, Draco (active probably in 621), who was overwhelmingly concerned with eliminating and preventing ritual pollution, and whose laws (about which we know little) later had a reputation for their use of harsh punishments. Solon, who repealed all of Draco's laws except that regarding murder, thought pollution was not to be feared, but rather overreaching *hybris*, the violation of justice leading to so violent an attempt to restore the dispossessed that it tears the state apart. It is in everyone's interest to restrain themselves in the pursuit of their own interests, so that no one is forced to the wall. If the lower classes are driven to revolution, even upper class interests are not served. Not that Solon saw this as an argument for democracy, for he did not trust the judgment of the crowd, but he did think that perhaps the upper classes, born to rule, could see the point and show appropriate restraint. Thus, as Plato later noted, the argument for reform rested on ethical egoism—it is in *our* interest to

place ethical restrictions on the pursuit of our interest. The reasons Solon gives why this is so make no reference to the supernatural, but only to the political consequences of one's actions. In contrast, Hesiod, a traditionalist, treats injustice as a form of pollution, causing such things as crop failure and plague, due to Zeus's interest in enforcing a moral law on human beings. Solon expects the proof of his point of view to be found in common experience when the outcome of his and others' policies become clear and open to public inspection, not in religious tradition or the oracles of the gods.

In Solon's view, the effects of the unjust action on everyone in the city made it of public concern. It was well established that actions which polluted the city were a public concern, since everyone suffered in the calamities which pollution brought. Solon thought acts of injustice, at least in the aggregate, led to their own calamities, revolution and tyranny. So it was a matter of public interest that such actions be prevented or punished. This was a reversal of the old attitude, that such actions were matters of personal injury, so that they were to be avenged, if possible, by those who were injured, perhaps with the consent of the state. In time, Solon's view became commonplace—the 4th-century orator, Demosthenes, expressed what had become ancient wisdom when he said, “every deed of violence is a common injury, affecting those also who are not directly concerned.”²⁴

We find the democratic ideology presented in Herodotus in a debate among the founders of the Persian state on the relative merits of different political constitutions.²⁵ One form of government argued for there is called *isonomia*, and described by its proponent as the rule of the masses, making use of lots to choose who shall hold public office, and making the assembly the source of all public policy. Clearly democracy is intended, though *isonomia* means not “rule of the people,” as *demokratia* does, but “equality of the laws.” The laws were to be equal inasmuch as they applied to every citizen equally, but also inasmuch as they established equality of political power among the citizens. The point is made that when political privilege is restricted, those receiving it become likely to abuse their power in unjust acts toward those who lack it. Solon had recognized that the ruling class in the state abused their power, but he attributed this not to the inevitable action of the structures of power, but rather to personal vices and immorality. In Herodotus's presentation of the discussion among the leading Persians concerning the proper form of government to institute, the advocate of democracy,

²⁴ Demosthenes, xxi 45. Cited in Vlastos (1946) 70.

²⁵ Herodotus, *Histories* III 80 ff. The debate, of course, is imaginary, a way for Herodotus to present a little analysis without leaving his narrative structure.

Otanes, argues that even the best of men, placed in a position of absolute power, would be changed from his customary, virtuous view of things. The people should rule, not because they are virtuous, but because an equality of power means that no one is corrupted by power, and leads to a sense of responsibility to others rooted in an awareness of one's dependence on the others, particularly when the law allows a person to be judged for his actions when in office, and assures that no one will remain in office indefinitely. What is defended here is a rule of law, as opposed to the rule of men.²⁶ It is this rule of law, this balance of opposing powers and alternation of dominance as different men gain office, that informs the thinking of the early Ionian cosmographers concerning the natural processes that underlie the cosmos.

6. THALES OF MILETUS

There are some who think that the very ancient and indeed first speculators about the gods, long before the present age, made the same supposition about nature [as Thales]; for they wrote that Okeanos and Tethys were the parents of coming-to-be . . .

Aristotle, *Metaphysics* I 3, 983b27.

. . . Homer, who, by saying "Okeanos begetter of gods and mother Tethys," declared all things to be offspring of flux and motion.

Plato, *Theaetetus* 152E.^{27 28}

We have no more than half a dozen passages in the whole of the early Ionic philosophy, and that makes it an easy study. Yet learning prides itself most

²⁶ Vlastos (1953).

²⁷The cosmology we find in Homer imagines the sky as a brazen bowl set upon the earth, with Okeanos, a fresh-water river, flowing around the edge of the earth next to the bowl. Below the roots of the earth and the sea is Tartaros, and Chaos, a great chasm, with a brazen floor and iron doors. The Sun, and presumably the other heavenly bodies, sails around to its place of rising on Okeanos after it sets, or else travels through the underworld to get there. The bowl of the sky is filled, lower down, with mist and aer, and higher up with aither, which is bright and shining, and dry. Sometimes the Gods are imagined living on the Sky, more often in the space between sky and earth, which is divided among them, Zeus receiving the sky, Poseidon the Sea, and Hades the Underworld. Hesiod's *Theogony* provides a related scheme. To a considerable degree, Thales and his successors replaced these picturesque elements (which differ in different poems) with a scheme described in purely physical terms.

²⁸ For Homer's scheme and other early cosmogonic and cosmological concepts, see Kirk and Raven (1957) Chapter 1, which follows Cornford (1926), (1952), in identifying a basic cosmogonical scheme in which things begin with the separation of sky and earth, this separation being associated with a storm of some kind, and a circular motion. It is in the gap between sky and earth that the world evolves.

upon the ancients, for we may be most learned about that of which we know the least.

Hegel, *History of Philosophy*, Part I Chapter 1, A: The Ionic Philosophy

The first scientist, according to Greek historians, was **Thales of Miletus (ca. 615 - 545 BCE)**, the only man traditionally regarded by the Greeks as one of their Seven Wise Men on every known list.²⁹ His reputation as a wise man rested on a knowledge of medicine, engineering, geometry, astronomy, navigation, and others of the more mysterious arts, wide traveling, a knowledge of foreign peoples, current affairs and historical matters, and considerable acumen in practical politics. Here was a man who knew what to do in

²⁹ For Greek thought in general, Guthrie (1962-81) provides an excellent long treatment carried through Aristotle. Armstrong (1959), Irwin (1989) and Ricken (1999) are good brief introductions to the whole Ancient period. Peters (1967) provides brief histories of the usage of key terms in Greek philosophy, and is extremely useful for the student without a background in Greek. The articles in the *Routledge Encyclopedia of Philosophy* (1998) edited by Edward Craig, and the older MacMillan *Encyclopedia of Philosophy* (1967; 2nd ed. 2006) edited by Paul Edwards, are often useful, and the brief accounts in *The Oxford Classical Dictionary* (1961; 2nd ed. 1970; 3rd ed. 2007) are useful especially for minor figures. See also Gill and Pellegrin, eds. (2006). An excellent online source is the *Stanford Internet Encyclopedia of Philosophy*, at <http://plato.stanford.edu>, with thorough articles written by first-rate scholars, and continually updated. For Pre-Socratic thought (dealt with in Chapters I and II here), see Osborne (2004), A.A. Long (1999), currently the best general introduction, Barnes (1979), Furley and Allen (1970), Kirk, Raven and Schofield (1983) with a pretty complete collection of fragments and testimonia in Greek and English, Mourelatos (1974a), and West (1971). A judicious and insightful treatment with full, if dated, documentation, that makes a good starting point for investigation is Zeller (1881). I shall not generally cite these more comprehensive sources for individual thinkers below, though I have consulted them with profit in every case. For Thales, see especially West (1971), Dicks (1959), and O'Grady (2004). Our ancient sources for Thales are chiefly the reports of his doctrines in Aristotle's works, and stories about his life in Herodotus's *Histories*. For pre-Socratic thought in general there are three main sources of information: (1) Reports in Aristotle, who systematically reviews the work of his predecessors on each topic he discusses, and in Plato, who took increasing interest in Socrates's predecessors in his later works, (2) fragments of the works of the pre-Socratics preserved in later authors, and (3) an historical tradition rooted ultimately in the *Physical Opinions* of Aristotle's successor, Theophrastus. Behind Theophrastus, Plato and Aristotle there lies a lost collection from the philosophers and poets by the Sophist, Hippias (see Chapter 3 below), emphasizing continuity in their thought, and intended for use by rhetoricians who needed a guide to the maze of opinions, and another lost collection by the skeptical Sophist, Gorgias (Chapter 3 below), who dwelt on irreconcilable contradictions, for which, see Mansfield (1999). These sources led Plato and Aristotle to see these thinkers through a Sophistic lens, most especially in the case of Heraclitus (below, this chapter), the apostle of flux, and Parmenides (below, Chapter 2), the apostle of unity. Aristotle's work (dealt with in Chapter 6 below), depending on a library of ancient works he deliberately collected, assured that Theophrastus (Chapter 7 below) and the later tradition would arrange the opinions in accord with Aristotle's *Topics*, and with an eye to laying out preliminaries for consideration in the individual Aristotelian sciences. In the Hellenistic period, in which Aetius's *Placita* ("Tenets," perhaps as early as 200 BCE) was produced along these lines, there was a renewed interest in the conflicting views of the early philosophers arising from the skeptical bent of Hellenistic thought, and this interest is reflected in Aetius's book (reconstructed by Diels in the 19th century from later sources drawing on the work. For critiques of Diels's work, see Mansfield (1999).) Hellenistic writers, for instance Diogenes Laertius, also produced treatments of "successions" of philosophers, taking it that they fell into schools with designated strings of "successors" as their heads, on the model of the Hellenistic schools. One motive here was to establish the antiquity of and find notable predecessors for current schools. This made for an interest in biography, which was satisfied, too often, by making things up on the basis of the extant writings. For an excellent survey of the Ancient 'doxographical' tradition with extensive further references, see Jørgen Mejer, "Ancient Philosophy and the Doxographical Tradition," Ch. 2 in Gill and Pellegrin (2006).

critical moments in public affairs.³⁰ He advised the twelve chief cities of Ionia to form a confederation when the power of Croesus of Lydia threatened their independence. His advice was not taken, and Lydia gained control of the region. He predicted a solar eclipse that occurred in 585 BCE, while serving as engineering advisor to the Lydians on campaign against the Persians. The prediction was almost certainly based on the assumption that the cause of a solar eclipse is the interposition of the moon, or a body accompanying it, between the sun and the earth, for he was said to have recognized that at least some heavenly bodies were earthy in nature, and to have observed that Solar eclipses always occur at the new moon.³¹ Eudemus, a student of Aristotle who wrote histories of mathematics and astronomy, is reported to have attributed a number of simple geometrical theorems to Thales, though it is generally assumed Thales would not have proved them in anything like the Euclidean fashion. He was said to have learned geometry in Egypt, and to have written books on the solstice and the equinox.³² Less reliable stories reflect the conflict of ideologies. One tells of his falling into a well while observing the stars, portraying the scientist who would replace the Aristocrats' priest as an absent-minded and impractical fool. Another, in the opposite sense, relates his cornering the market in olive presses to show that scientists knew better than most how to deal with the real world, and could easily become rich if they cared to. Thales was, of course, a member of the upper classes, and that in a city of great wealth and influence. Philosophy does not begin, or even easily survive, among peasants in a backward society, and we shall find philosophers associated with the rich and influential, in powerful urban cultures, through its entire history. Indeed, philosophy is rather expensive (if not nearly as expensive as modern science), since, as Aristotle observed, it is only those with leisure (who live on the labor of others) who can devote the necessary

³⁰The Seven Wise Men occur in a number of legends. The general plot is that some prize is assigned to the wisest man in Greece, and the person selected professes he is not the wisest, sending it on to a second person, and thus it makes the rounds of the seven, and is returned to the original recipient. He then deposits the prize in a temple, in which the story is preserved, and no doubt told to tourists who view the artifact in question. Various apothegms were attributed to the wise men, the gist of which is often that one must not overreach, but these seem to have been floating sayings, each attributed to a number of different people. They were displayed in prominent places in temples of Apollo, and even at wayside shrines. Those identified as one of the seven seem always to have been legislators.

³¹ It is hard to believe he would not have observed this if he had access to the records of eclipses maintained by the Mesopotamian priests. Lebedev (2006). On the other hand, given that Anaximander was privy to the same observational information that Thales was, it is surely most reasonable to attribute something like Anaximander's account of eclipses to Thales. Anaximander did not suppose that the moon shone by reflected light, and took it that some body occluded the Moon gradually to account for its phases, and the same body would occlude the Sun, sometimes, as it occluded the Moon at New Moon.

³² So, Diogenes Laertius. He was supposed to have measured the height of a pyramid using similar triangles and shadows cast by the Sun, to have shown that a diameter (a line through the center of a circle) divides a circle precisely in half, and a number of other elementary theorems.

time to it.

Thales asserted that all things had come from water, a view Aristotle traces to the conviction that all life arose from and is nourished by the moist.³³ Very likely, he thought the world like a living thing that grew from an embryo. This notion was a commonplace among physical speculators before Parmenides, and an archaic element of mythology in the Eastern Mediterranean. The early Mesopotamians thought the earth arose when fresh and salt waters mixed, forming silt and gradually building the first land. (The silting up of harbors was a familiar problem in the ancient world).³⁴ Thales also thought the earth rested on water, which explains earthquakes, for they occur with the agitation of the water beneath. The earth rested on an abyss of fresh water in Mesopotamian thought, and Thales may have drawn on this, or on Egyptian sources, for the idea is not to be found in Greek mythography.³⁵ Extrapolating back from later thinkers, possibly Thales thought there was a great sea before the earth existed; that a great eddy or whirlpool arose; that the earth somehow formed in the center, while the whirling storm winds raised by the eddy carried the heavenly bodies round with it; and that the whole is steered by the divine and ageless waters in which it rests and from which it arose. Or perhaps the world arose biologically, from a seed of some kind that formed in the waters, rather than a whirlpool. Perhaps there are other worlds arising at random, and coming to an end after a while, just like our own. Thales may well have said that the Earth is spherical,³⁶ and if so, then he might have supposed that a sphere of water

³³ *Metaphysics* I 3, 983b18, which says that *it is said* that Thales held water is the *arche* of all things—presumably Aristotle depended on a secondary source for his information, and he never claims knowledge of any writing left by Thales. That water is the *arche* means, to Aristotle, that all things are made up of water, and that they come from and can be resolved into water. If Thales actually said that water is the *arche*, he probably meant only that all things come from it.

³⁴ Characteristically, the Hegelian approach to the history of philosophy makes out Thales' assertion that everything is water as a grand speculative leap, postulating a unity behind things for the first time, a unity the analysis of which would underlie all future philosophical speculation. But this view underestimates "pre-philosophical" thought, and overestimates Thales. It is unlikely that he thought everything *is* water, that is, every kind of stuff is some form of water. This sort of view is probably first to be attributed to Anaximenes, though it is easy to move from the one view to the other once the question is raised *how* things arose from water—perhaps it is a reversible process involving no essential qualitative change, but only rearrangement in space, or the variation of some other accidental quality.

³⁵ In the Hebrew *Psalms* the earth is founded upon the seas (24:2), and in the Gilgamesh epic Marduk builds a raft and a hut of reeds on it, and this is the earth. Homer, on the other hand, thinks the Earth extends downward into Tartaros, and he does not place water above the heavens, or below Tartaros. Hesiod makes the Earth firm and unmoving even before the heaven or seas are created (*Theogony* 117), and, though he separates Earth and Sky with a great storm, Chaos, in his cosmology, this is not, it seems, a matter of forming a bubble or whirlpool in a vast waste of waters, as in the Mesopotamian (and Egyptian) myths.

³⁶ See O'Grady (2004). The opinion is reported in Aetius and Ps.-Plutarch, and, perhaps, obliquely, in Aristotle, *On the Heavens* 294 b14-15. Aristotle observes that of early thinkers some thought the Earth spherical and some flat and shaped like a drum (no doubt Anaximander was intended), and then lists Anaximenes, Anaxagoras and Democritus as others who took it to be flat (like a pancake). Presumably he was proceeding from earlier to later thinkers, though he does not say who thought the earth spherical.

was at the center, islands of earth floating upon it like rafts, the whole in the midst of the cosmic storm. Thales is reported to have said that all things were full of gods,³⁷ which suggests that his world was driven by divine forces dwelling in things (Aristotle suggests he may have thought soul was found in all things), perhaps all of them derived from the divine life of water.³⁸

This probably *denied* the activity of gods as we might conceive it, for it suggests that things naturally have the principle of movement and development within them, and do not draw it from a supernatural deity standing outside the world. Similarly, his statement that the lodestone (a natural magnet) has a soul, since it can move things,³⁹ suggests that personal souls are a special manifestation of powers universal in nature, not that stones have personality. On the other hand, his view concerning souls was preserved because it reminded people of Plato's view that all motion arose ultimately from souls, a view that forms, in Plato, part of an optimistic view of the world that attributes natural regularities to the operations of reason, bringing the world into an order reflecting the Good, which governed the actions of all souls. At least one motive of the historians who reported Thales's views here was to indicate how ancient Plato's view was, and thereby to give it some authority. Much of what we might have found most interesting in Thales's thought may now be lost because it did not reflect historians' notions of how the story should go. It may also be that his anticipations of later thought, or, an Ancient Greek would no doubt have said, his preservation of ancient esoteric traditions of philosophy which were once more to come to be fully understood in later thinkers, were largely illusions fostered by later philosophic historians looking for a good story in the evidence.⁴⁰ But, having said that, there no doubt *is* a story to be told, and we must rely on the evidence we have, correcting things where we are able, in reconstructing what it was. If there *were* a fellow such as Thales was supposed to be at the time Thales lived, what would the stories about him look like? Rather like the stories we find in Aristotle and Herodotus, surely. So it is not unreasonable to say he was a scientist whose views lie at the foundation of the later tradition. We need to be critical, as critical as we can, but we don't want simply to set aside all the available evidence.

Thales may have developed his ideas from traditional Mesopotamian views, but they move with a new

³⁷ Aristotle, *On the Soul* I 5, 411a7.

³⁸ There is no reason to deny that this involves a continuation of the pre-literate belief in spirits discussed above.

³⁹ Aristotle, *On the Soul* I 2, 405a19.

⁴⁰ Harold Cherniss (1935) and (1944) offer a severe criticism of Aristotle's historical remarks, so central to our tradition, along these lines, which scholars now largely reject.

spirit. Aristotle notes that Thales makes no mention of gods outside the world, even if he took the stuff making up the world to be divine. He seems to avoid the assumption of personality behind the world, and so speaks of water, not the god of waters. The mechanism of the great eddy that gives rise to the world, in the later Mesopotamian and Hittite creation tales, was connected to the power of a storm god, and one must suppose that Thales, if he assumed such a thing, connected it to an innate, but impersonal power of motion found in the cosmic water. The personalities of the old divinities are stripped from them, even if the divinities themselves are preserved as forces of nature, and with the removal of their personalities the political relevance of the old myths is transformed in the new, naturalistic world view. One no longer deals with a king and a house of aristocratic warriors, favoring and legitimating aristocratic arrangements. Instead there is a world ruled by the natural behavior of the stuff making it up. With Thales, for the first time, the scientist is pitted against the priest.⁴¹

Thales, like all the naturalistic thinkers we shall be examining, presents a *surprising* view of the world. Everything comes from water, and is animate. Plain sensory appearances do not present us with this reality. Why does he deny that things are as they appear? Partly, no doubt, because wisdom ought to be surprising, and is unlikely to be much attended to if it is not, but also because he seeks explanations, and so a theoretical account of the world from which the appearances can be deduced. His faith is that something simpler underlies the observed complexities in the world, something of which a precise account can be given. And he presented a “view of the world,” quite deliberately—it was his *intention* to do so. Early Greek philosophers recognized one another as fellow craftsmen, who wished to give an account of “all things,” a phrase that pops up repeatedly, for instance, in the fragments of Xenophanes, Protagoras, Heraclitus, Empedocles and Parmenides. This account was intended to be systematic, explanatory, unified, and critically argued. It was also intended to be significant for life, provocative and unconventional, an improvement on the traditional view of all things

⁴¹And so Nietzsche observes, (1876) 7-8, that Thales was the first to overcome the preliminary mythical stage of philosophy. (“Overcome,” *aufheben* in German, is a Hegelian term, indicating that one criticizes and rejects the earlier stage, developing the criticism internally, so that the earlier stage refutes itself when it is thought through carefully enough, but that one also incorporates what is true in the earlier stage in the next stage, preserving it as a “moment” driving the next stage.) He also suggests that Thales overcame the “sporadic-proverbial” phase, that is, that his views fall together into a theoretically unified whole. Finally, Nietzsche suggests that Thales overcame the division into various disconnected sciences, presenting a single unified account of all reality. The move beyond personality is perhaps most centrally an abandonment of a story about what someone did, as it happened, and the substitution of an account of an inevitable process rooted in the unchangeable, the *arche*. So Windelband (1893) p. 36, remarks, “the transition from myth to science consists in stripping off the historical, in rejecting chronological narration, and in reflecting upon the Unchangeable.” But, one might rejoin, the Gods are unchangeably there, as are their psychologically determined, and fundamentally intelligible, actions. To be a history or story at all, the series of events has to make causal sense, somehow. The shift away from theocentric explanation is less fundamental than has often been supposed.

to which it was often deliberately compared. This is the declared intention of these fellows, not just our anachronistic reading of them.⁴²

This account of “all things” can be done in several ways. One option, an option we associate with science, is to treat the world in terms of its components, tracing the behavior of a thing to the ingredients making it up and the way those ingredients are structured. Thales follows this line. He intended, of course, to explain some large scale features of the world—the continuous mutability of things is due to water’s flow and its ability to change into different forms, and the presence of life is explained, for water is the stuff of life. But we should not stop here—if this is really the explanation of things, it should provide a clue to the details. We need to fill in particulars about what arises from water, and how, so ice when it gets cold, vapor and steam when it warms, and air, perhaps when the vapor thins, and silt that forms where salt and fresh water meet, and from the compression and drying of the silt, earth and stone, and the tissues of plants, and from those, the tissues of animals—one can see how Thales might have thought everything that is comes from water. There is a single chain of transformations, it appears, and in the end, everything can be traced back to a quantity of water after some finite number of changes. Aside from the evidence that there is such a single chain of transformations, the history of things is suggested by the theory, for water is just the stuff to form a whirlpool, with heavier things settling toward its center, and just the stuff to give rise to a living thing. His theory seemed a promising sketch of the *single* reality lying behind the world. The sketch needed to be filled in, but one could see how further work might accomplish that job, and understand Thales’s faith in his theory.

7. ANAXIMANDER OF MILETUS

The earth the ayre the water and the fyre
Then gan to raunge themselves in huge array
And with contrary forces to conspyre
Each gainst other by all meanes they may.

Edmund Spenser, from *An Hymne in Honor of Love*

Anaximander (610 – after 546),⁴³ who probably knew Thales, was a prominent citizen of Miletus,

⁴² A.A. Long (1999) 10-15.

⁴³ For Anaximander, see Couprie (2003), Hahn (2003), Naddaf (2003), Kahn (1960), Heidel (1906), Baldry (1932), and Vlastos (1947).

who led the founding expedition of the colony at Apollonia on the Black Sea. We have few tales of his life, but luckily know a good deal about his views because of a book he wrote, a most remarkable performance that established the scientific tradition in the West. It was likely a history, beginning with a cosmogony and cosmology, and then going on to give an account of the origins of human beings and the development of culture, accompanied by a map of the world. It provided a scientific substitute for Hesiod's *Theogony*, and served as the model for the Naturalists (*Physikoi*) in the next two centuries.⁴⁴ The book survived into later centuries to be reported by Hellenistic historians, but the last copy has long since disappeared, no doubt with the destruction of the Ancient library at Alexandria or Pergamum.

Anaximander held that the world arose from an "Unlimited" (*apeiron*) substance, an even-handed mixture of the opposed elements making up the world. Anaximander called it the Unlimited because of its spatial extent, though some Ancient historians claimed that he named it so because it had no characteristics at all, and so was undefined, a possible but unlikely meaning for the Greek word, and an entirely anachronistic reading for Anaximander.⁴⁵ Perhaps this misinterpretation was suggested by Anaximander's claim that the Unlimited leaned to neither side when it comes to opposite qualities, so that it is neither hot nor cold, sweet nor bitter. Anaximander rejects the traditional view making it water, and we are told why in one of our sources.⁴⁶ If any one sort of stuff predominated in the mixture, it would, sooner or later, utterly destroy its opposite. But we observe in all cases that both opposites are present, and in more or less equal quantities. This is because the opposites are always of equal strength, and so, though each seeks to destroy the other utterly, neither can get the upper hand over the other for any length of time. It tires after a while, and the other then makes a comeback, establishing its own temporary dominance in turn. The stuff from which the world arises must be unlimited in extent, for once the opposites are separated out and pitted against one another the fire tends to burn up all its moisture, which must be replenished from the Unlimited surrounding it. Given the

⁴⁴Naddaff (2003) points out that the historian Diodorus of Sicily (1st century BCE) began his history of Greece with accounts of the origin of the world, of animals, and of political states, and Thucydides apologizes for not doing much with prehistory in his history of the Peloponnesian War, arguing that people before the time he deals with had not done much worth recording—the expected people would expect more of a prologue in prehistory than they got.

⁴⁵The interpretation fits the NeoPlatonic and Hegelian notion how philosophy must have developed, suggesting that Anaximander realized that the One of Thales, which lies behind and is *all* things, can fall under no empirical concept, else it would be one of those things. Hence it was widely accepted by 19th-century Hegelians. Originally, no doubt, it was suggested by the use of the word "*apeiron*" in the Pythagoreans, to indicate the companion to the one which lies behind all things, and in Parmenides, who argued that anything "unlimited" was impossible. But the ideas captured in those uses of the terms were new, not anything preserved in an ancient poetic tradition from earlier ages, and there is no reason at all to project them back to Anaximander.

⁴⁶ A very late source, Simplicius (490–560 CE), in his commentary on Aristotle's *On the Heavens*.

random production of worlds over an infinite period of time, there should be no moisture left now if there had been only a finite quantity to start with, therefore the initial quantity of moisture, and so of each of the other opposites, as well, must have been infinite.⁴⁷ For Anaximander, this unlimited stuff from which the world arose is immortal and divine, though clearly, like Thales's water, without personality.⁴⁸

Anaximander's rejection of Thales's view that all things arose from water perhaps led to the development of the view that the kinds of stuff other than water are actually forms of water, a view we shall find explicitly stated in Diogenes of Apollonia later.⁴⁹ Water could presumably take on a number of different forms without anything being destroyed by anything else, though we need, perhaps, some way to guarantee that one form does not overwhelm the others. Anaximander's difficulty seems to dominate early reflections on the stuff making up the world. Heraclitus speaks of a "measured" transformation, which preserves the original balance of different forms of fire, and one reason for Anaximenes's choice of air as the one stuff may be that air does not too aggressively convert the stuff it surrounds to air.

Anaximander thought the Earth shaped like a section of a pillar, flat and circular on top, its height about one third its diameter. The question arose why the Earth kept its place, rather than falling. Anaximander answered that it was equidistant from all things and so encountered the same thing no matter in what direction

⁴⁷ Presumably, despite the destruction of more and more moisture over time, the proportion of moisture to fire remains equal, so that fire does not gain dominance. After all, both quantities remain infinite. See Dancy (1989). Vlastos (1955) 73, note 20, observes that the Unlimited may derive from Chaos as it is conceived in Hesiod's *Theogony* 736 ff., which is vast in extent, the source of earth, sky, sea and air, disturbed by internal motions, that is, storms, and immortal.

⁴⁸ Perhaps the contrast with Thales can be made stronger. The single source of things, water, in Thales, suggests a single power or rationale for things, realized everywhere because it is inherent in water, which is everywhere. Anaximander, on the other hand, postulates many conflicting opposites which do not arise from a single source, except insofar as they are mixed together in the unlimited stuff and separate off from it. Hence Ritter, *Geschichte der Philosophie* III c.7 (1829) refers to Thales, Anaximenes, Heraclitus (this chapter) and Diogenes of Apollonia (Chapter 2 below), the "dynamical" school among the Ionians, who held that things transformed one into the other and that the nature of a single element, operating alone, drove cosmic processes, and Anaximander and the Atomists (Chapter 2 below) the "mechanical" school. Ritter's view was rejected by Zeller and later historians, chiefly, it seems, because the various components of the indefinite in Anaximander each behaves, in its own way, "dynamically," as the atoms do not, acting only "mechanically." It does seem that Anaximander's view is importantly different from Thales and the others, here, but perhaps we should say this is because it is *pluralist*, allowing many fundamental sorts of stuff that may destroy and feed off one another, but do not transform one into another. Would that mean that Anaximander would escape the critique of Parmenides (Chapter 2 below)? Parmenides, reasonably, might have thought that his insistence that no stuff could be destroyed or created cut against Anaximander's style of pluralism.

⁴⁹ Gomperz (1896) I 48 suggests that Thales's notion that "all things proceed from water and return to it again" was liable to expansion into the notion that all things are forms of water, but we need some reason to make such an expansion, and Anaximander's argument provides one.

it might choose to move. Thus, there is no reason why it should move one way rather than another.⁵⁰ It will not move, for if it did, its direction of motion would have no cause. It seems unlikely that pure mathematical formalism underlies this argument. Rather, Anaximander would have noted that the Earth, the opposite of Fire, would have withdrawn from fire as far as it could, and perhaps been attracted to its like, and so, having separated out into the center it will remain at the center, equidistant from the fire on every side, rather than approaching the fire, and earthy objects will “fall” towards the earth.⁵¹ Possibly, as in Empedocles, this separating out of the opposites would lead to the beginning of a rotation, or possibly it was *due* to rotation.

The application of the Principle of Sufficient Reason, that there must be some reason why everything that is the case is just as it is and not some other way, is notable, and we shall find this principle often resorted to in early Greek thought, but it might be objected that there are in fact spatial asymmetries here, so that the principle does not apply. For instance, the sun and moon would seem to create an imbalance, so that the earth would move toward, or away from, one or the other. (Empedocles uses this asymmetry to explain the beginning of the rotation of the heavens.) But Anaximander’s account of the origins and structure of the world obviates this difficulty, one assumes deliberately. What happened was that air and fire, productive of hot and cold, separated out from the unlimited, water condensed at the center from the air (which is to be conceived as mist), and earth may have arisen from the water when it was dried out, or through silting. The separation may initially be due to a vortex of some sort, but as a matter of fact a vortex is never mentioned by our sources in connection with any thinker before the Atomists and Anaxagoras, so some other process, perhaps a biological one like the development of a seed which separates out from the Infinite, might drive the process in earlier thinkers. However that may be, at first earth was at the center, and, moving outward, there were layers of water, air, and fire. Now the whole mass, as the fire heated it, blew up like a balloon, until the outer layer of fire, stretched to its limit, burst apart, and there resulted a collection of rotating rings of fire enwrapped by air. Possibly the air and fire were thrown outwards together to form the rings, and the larger masses went the

⁵⁰ Gomperz (1896) I 51, points out that Anaximander argues for the law of inertia here, that a body at rest will continue at rest unless it is moved by an outside cause, and argues for it on *a priori* grounds. Aristotle denied this, holding that a body has a natural movement toward the center. Anaximander would have to give some other explanation of falling.

⁵¹ Keimpe Algra (1999) 55–56. Algra points out that this might also explain why the sun was supposed by Anaximander to be farthest away from the earth, the moon closer, and the stars closest of all. The sun and Moon, bright as they are, might shine right through the smaller amount of air blocking out the light of the stellar rings, and the earth would drive off the bulk of the fire in the world to as great a distance as possible, allowing only smaller bits closer in.

farthest.⁵² The air enclosing the rings obscures the fire, except at certain breathing holes through which the fire continues to be nourished by moisture drawn up from the sea. We see the fire through the breathing holes, and so the sun, moon, stars and planets appear. The world will eventually die when all the moisture is used up. The rings of fire maintain the symmetry of the whole structure, while the breathing holes explain the appearance of asymmetry. The earth thus remains equidistant from all the other masses, trapped in the center of the whirlpool with no gap through which it might escape.

Anaximander must have constructed his astronomy deliberately to account for observational data, and he does a good job of accounting for what could be observed at the time, on the assumption that the Earth is flat. The Earth, shaped like a section of a column (a ring without a hole), is tilted relative to the rings of fire that constitute the heavenly bodies, the 'higher' part toward the North, which accounts for the angle of the ecliptic. The Sun-ring apparently moved back and forth along the central axis of the system between the Summer and Winter solstices, perhaps in a cycle preserving the original symmetry over time, just as hot and cold oscillate about the mean.⁵³ Heraclitus, apparently assuming Anaximander's astronomy, remarked that the sun will not exceed its measures, that is, go beyond the solstices, for justice will not permit it to do so. Perhaps Anaximander postulated a general tendency of the world to maintain symmetrical arrangements, and so to return to a symmetrical arrangement once disturbed. Thus every disturbance of any sort would produce an oscillation about symmetry. In any case, this scheme accounts for the observable movements of the Sun. The stellar rings were closest in at nine earth-diameters' distance, then the moon at 18 earth-diameters' distance,

⁵² This is the suggestion of Gomperz (1896) I 53, who notes that the rule might be suggested by someone accustomed to using a sling, or observing children's games.

⁵³ However Anaximander theorized solar eclipses occurred, he would have known the observational facts Thales did, namely that they occur during the New Moon, when Moon and Sun are at syzygy. Aetius says Anaximander took it that the breathing holes were blocked off during an eclipse, and in the waning of the Moon. What might block off the hole? It seems the Moon's *aer* must not block the Sun's light, perhaps because it is thinner than the Sun's *aer*, and, though sufficient to block the inferior light of the Moon's fire, not up to blocking the light from the fire of the Sun. Whatever it is that blocks the Moon's light to produce the phases of the Moon must block the Sun's light too when an eclipse occurs. The body in question remains close to the Moon, of course, perhaps it even rotates around it very close by it, closing the breathing hole of the Moon like a shutter, and that is why it does not block the Sun except at the New Moon. Perhaps some other body, rather more transparent, is responsible for lunar eclipses. Anaximenes was said by some to have held that there were earthy bodies in the heavens, and these have been assumed by some to account for eclipses and the Moon's waxing and waning. An earthy object moving in and out of the way of the Moon's light would not block the stars on Anaximander's assumptions, since it is above them. This all provides a reason for placing the stars below the Moon and Sun, and the Moon below the Sun, a feature of the system that is otherwise somewhat mysterious.

and lastly the sun, farthest out at 27 earth-diameters's distance.⁵⁴ There are three points here that represent a real abandonment of all earlier notions, and form a foundation for the development of later astronomical theory: the notion that the earth is surrounded on all sides, even below, by empty space, the circular orbits of the heavenly bodies, passing entirely around the earth, and the placement of some celestial bodies farther away than others.⁵⁵ Moreover, the system is meant quite literally, and does not shirk its explanatory duties to revel in the poetic symbolism of myth. Anaximander is quite reasonably considered the founder of scientific astronomy.

Anaximander claimed that living things came into being from moisture warmed by the sun, and that land animals were first enclosed in a thorny bark, emerging on the newly formed land in new shapes when the bark split, allowing their escape. He must have modeled this on the life cycle of a dragon fly, or something like it (or perhaps on the hatching of bird's eggs—the cosmos had been compared to an egg in some Orphic cosmogonies). He saw that an entirely new form was needed for an animal to live on land, a form impossible to life in the water, and so supposed that something living in the water might, like the nymph of a dragon fly, metamorphose into the required shape once land was available. No doubt, the water-based stage later dropped out of the life-cycle. The story is also modeled, it seems, on the story of the origins of the luminous heavenly bodies. In both stories reference was apparently made to a rind forming, due to the action of heat, around something, *like the bark around a tree*.⁵⁶ Apparently there is a parallel between the way the cosmos was formed, and the way in which animals were first formed. Human beings also, he thought, must have arisen full grown from some other creature, since babies require nursing, and the *first* human beings could not have survived had they begun as babies. Anaximander assumed that simpler living things arose in the first place spontaneously from the mixture of the elements, and that more complex animals are descended from simpler ones.

As in astronomy, in anthropology and zoology Anaximander established the new scientific paradigm. Mythological accounts of the world never really took seriously the problem of accounting for the development

⁵⁴It has been suggested by Couprie (2001) that this may be a poetic way of saying the stars were pretty far off, the moon farther yet, and the Sun even farther than that. He argues that it could mean this because Hesiod says that an anvil dropped from the heavens would take nine days to reach the surface of the Earth (*Theogony* 722-725), and the number nine here would seem to mean only "a really big number." He notes that the siege of Troy, which was really long, took nine years and was finished in the tenth, and the journey of Odysseus home from Troy took nine years, and he arrived in the tenth. Stephen White (2008) argues that the numbers are more meaningful than that, and proposes an account how they might have been arrived at through observation.

⁵⁵Couprie (2003) lays out the evidence for this reading of Anaximander most convincingly.

⁵⁶This same phrase occurs in both accounts in the descriptions of these views in later doxographers, and it seems to be taken directly from Anaximander. See Schofield (1997) pp. 51–52.

of animal and human life. They either presupposed these things had always been present, or else pushed their explanations back into the myth-time when the divine freely intervened in the world, an indeterminate past time following its own laws and connected to the present only through sacred memory. Not only did they place the development of the present state of affairs in this mythological time, they essentially duplicated human society among the gods they postulated to explain its rise. The explanation did not account for the rise of society or life considered *as such* at all, but only for the rise of the particular forms society and life take here and now, presupposing other forms of these things, unaccounted for, among the gods.⁵⁷ Anaximander makes no reference to non-natural processes not at work in the present. He thinks that the early history of the world must be known as the later history is, by asking how the present state of things could have arisen, working from traces of the past in the present. Moreover, he gives a real story of development, tracing the rise of the complex structures of the biological and social orders from conditions in which these structures did not yet exist in any form.

The one fragment we have from Anaximander's book gives the principle by which things work. We are told by an Ancient commentator on Aristotle that for Anaximander

the source of coming-to-be for existing things is that into which destruction, too, happens, "according to necessity, for they pay penalty and retribution to each other for their injustice according to the assessment of time," as he describes it in these somewhat poetic terms.⁵⁸

Anaximander thought the Sun would eventually dry up the sea, which is only a remnant of the original moisture, and our sources mention no reverse process.⁵⁹ The retribution of the moist might come when the dried-up mass, in which the fire is now extinguished due to lack of fuel, soaks up moisture from the surrounding *apeiron*, and this, of course, might lead to a re-ignition of the fire. It seems enough to satisfy Anaximander's principle if the entire system, the whole *apeiron*, maintains its equilibrium, despite local variations from it, and the infinite extent of the *apeiron* makes that possible.

Friedrich Nietzsche⁶⁰ noted that in Anaximander for something to exist, to stand out in its own nature rather than merged in the Unlimited, is itself a sin requiring punishment. Nothing exists except at the expense

⁵⁷Nadaff (2003).

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⁵⁹Aristotle, *Meteorology* 353b5 ff., and Alexander of Aphrodisias in his commentary on the passage.

⁶⁰Nietzsche (1875). This book, if quirky, draws on very deep insight into Greek thought, and is very much worth reading.

of something else, and it is in the very nature of existing things to desire absolute power and the destruction of everything opposed to them. Justice continually brings about change because the actual compensation for injustice comes when one opposite gets its turn at dominance as the efforts of the other flag. Now the revenge for injustice inevitably overshoots the mark, since the victim of injustice desires absolute dominance just as much as the perpetrator. So further retribution is always necessary to correct the newest injustice.

One should be reminded of a feud between aristocratic families, in which every settlement embodies new grounds for grievance. Within Anaximander's cultural memory was a time when retributive justice was generally executed by the injured party or his family, there being no public police force. In cases of private injury the community would authorize retribution, but would not carry it out. Public enforcement of the law was first introduced to provide assistance to the weak, who could not carry out just retribution themselves. Anaximander conceived retributive justice as something accomplished by the aggrieved party, and the aggrieved party always goes too far. Thus every new situation that arises, partaking as it does of injustice, is a prelude to further change. The only *real* justice is to be found in the uniform mixture of the Unlimited, in which nothing stands out as an individual against anything else. With the breach of that ideal justice, only a perpetual movement toward justice through retribution remains. A major theme in Plato's thought, the way in which the actual world falls short of the static and eternal ideal, and for precisely that reason becomes subject to change and process, is already present here.

Later Greek views of the world are fundamentally variations on Anaximander's world-picture. With Anaximander, they assume an organic world-system, formed from opposites whose interactions are ordered by natural law. Anaximander's account of natural law goes beyond mere physics, of course. It finds in the physical world the same laws that rule the affairs of men. It is part of a world view to be applied to human life. Our very existence rests on aggression against others. A structured society in which continuous life is possible cannot accomplish an ideal state of justice in which aggression does not occur. It can only regulate the conflict among its members, so that the struggle seesaws back and forth, but never actually destroys one of the participants, and never results in the breakup of the society within which the struggle occurs. The symmetry is especially important here, for it makes the point that the state can only maintain itself so long as it is balanced, each of the classes in the state standing symmetrically related to the others. If one class overreaches itself, and lays claim to too much power, harshly restricting the other classes, the result will be a violent revolution, and the establishment of a new order of things, probably one in which the hitherto deprived classes now overreach themselves in turn, setting things up for the next political upheaval. The trick in managing a

state is to make sure that the continual shifts in power remain nonviolent, by keeping things as close as possible to the equilibrium point where each has only as much power as the others, and by providing mechanisms of adjustment other than military force. No one person or class can be allowed to rule. What must rule is Justice, but not the Justice of the King and his right to govern, rather, the universal law of retribution and the balanced and impartial laws of the state that govern the strife and keep it within bounds. To draw our conclusion, the new scientific world view entered the Greek world as a new ideology, a replacement for the old ideology of kingship provided by the myths, an ideology especially suited to those maritime powers that suffered most from overpopulation and class warfare, such as Miletus.⁶¹

How does all this relate to Thales? The warfare between opposites is presumably meant to fill in how the biological development of the world from the fertile waters happens, finding physical mechanisms behind biological potentiality. But the physical mechanisms add a positive side to the negative ideology of Thales's view. Not only are there no gods corresponding to King and nobility, but in addition, the processes maintaining order in the world are those that maintain order in the oligarchic state.⁶² We should note, of course, that just as Thales held on to the traditional views, rereading them without gods, so Anaximander's physical processes were originally interpersonal and political. The world arose because of a war. But he leave the gods out of it,⁶³ and these processes of interpersonal conflict become abstract. Physical and political processes equally exemplify the formation of an equilibrium between opposing forces, as a universal self-assertion in things produces the various struggles within which equilibrium is found.

The details of Anaximander's application of the law of retributive justice to the physical world as a whole are not easy to work out. It seems at present that the world is drying up as the fire nourishes itself on moisture. Will the Unlimited continue to provide sufficient moisture (as the whirlpool draws it in?) to keep the world going, or is the world doomed? Will moisture reassert itself, destroying the excess fire somewhere down the line, or will the fire destroy itself and the world with it, by using up all of its nourishment, leaving

⁶¹For the explicit application of this ideology to the city state in the 6th century, see Vlastos (1947), (1953).

⁶²One might note here that a state can be destroyed, but, drawing on the mass of human beings with their human needs surrounding it, a new state will arise, incorporating the fragments of the old. Thus political societies are perhaps like the worlds that arise in the Infinite, eventually dry up, and then are reconstituted from outside by a new accession of moisture.

⁶³Aristotle, *Metaphysics* II 4, 1000a9–19, *Meteorology* II 1, 353 a34–b5, contrasts the *thologoi* who speak in myths with Thales and Anaximander. It is to be noted that Aristotle does not mean, in attributing the “material cause” to Thales, to deny that water is divine, or to make it purely material without personality or knowledge of any sort. (*Physics* III 4, 203b3–15). Rather, the point is that the material properties of water, not its personal decisions, are what matters in explanation for him. Hussey, “The Beginnings of Science and Philosophy in Archaic Greece,” Ch. 1 in Gill and Pellegrin (2006).

nothing but a dried out husk? Will such a husk reconstitute itself by absorbing moisture from the Infinite once the fires are out, so that the fires then re-ignite from the moisture? Or will there be not even a husk, as all the solid matter is dissolved in water, and then drawn up as nourishing moisture to feed the gradually failing fires? We have insufficient information to answer such questions, but if Anaximander *did* think the world to be mortal, his immediate successors, it may be, did not, for they reinterpret the conflict of opposites in such a way that it no longer entails that anything is actually destroyed.

8. ANAXIMENES OF MILETUS

Anaximenes son of Eurystratus, of Miletus, declared that air is the principle of existing things; for from it all things come-to-be and into it they are again dissolved. As our soul, he says, being air holds us together and controls us, so does wind [or breath] and air enclose the whole world.

Aetius, *Opinions* 1, 3, 4.⁶⁴

Anaximenes of Miletus (died before 494 BCE),⁶⁵ was much younger than Anaximander, and quite probably never met him, but was no doubt familiar with his views, and took his starting point there. He wrote a book on the origins of the world as well, in which he held that air is that from which all things arose.⁶⁶ When air is thickened, it becomes wind (presumably what we breathe), cloud (thicker portions of air, water droplets, mixed with air), water (still mixed with wind, but less of it), earth (less wind yet), and finally stone (all wind driven out, most dense), and when it becomes finer and more relaxed it becomes fire.⁶⁷ Snow, like clouds, differs from ice in that it is mixed with air. It seems that thickening (condensing) is more a matter of change

⁶⁴Translation from Kirk, Raven and Schofield (1983).

0. Anaximenes has not attracted as much attention purely on his own behalf as most of the other pre-Socratic philosophers. See the treatments in Guthrie (1962-81), and Kirk, Raven and Schofield (1983).

⁶⁶Nietzsche (1876) Ch. 8 argues that Anaximenes, as reported in Diogenes Laertius II 3, was a pupil of the young Parmenides (Chapter 2 below), who was one of the founders of Elea, but lived before this in Miletus. He argues that Parmenides's earlier views are reflected in the second part of his poem, which lays out how things must be if one does postulate that the world arose from one element that is thickened or thinned by intermixture with non-being. Anaximenes followed these early views, on Nietzsche's account. Nietzsche follows the date given by Apollodorus for Anaximenes's birth, 529-525 BCE, which would rule out his having known Anaximander personally. His view certainly seems possible, though no one accepts it today.

⁶⁷Compare Plato's *Timaeus* 49a-c, which reproduces this account nearly verbatim without attribution, in order to attack it: Plato sees no reason to make air basic rather than any of the other sorts of stuff arising from it, and proposes instead that the "receptacle" of mathematical forms, physical space, is basic.

in consistency than a change in density, and the mixture with air in the felted substances make them crumbly and frangible to various degrees.⁶⁸ Heat and coldness are due to degrees of thickening, they do not cause it.⁶⁹ In short, Anaximenes seems to accept the conservation of matter, and to think that whatever is destroyed in the transformations of air can be regained again if the transformations are reversed. It is probably no accident that his air, like the Unlimited of Anaximander, is without definite qualities and undetectable in itself, taking on the qualities of the opposites only as it thickens or loosens up. It should be noted that he does not say, it appears, that all things *are* air, but only that they ultimately arise from it, but nonetheless whatever arises from it by thickening, felting and the like presumably is made up of the same stuff after this qualitative change. So Anaximenes can perhaps be credited with the argument that there must be something persisting underlying every change, and with identifying this one thing as air.⁷⁰ His account of the structure of the world also parallels Anaximander's. It is a whirlwind, the flat earth riding on the air, and the sun and other heavenly bodies igniting through their rapid motion. It appears heavenly bodies are themselves earthy in composition, at least in the sense that the fire making them up consists of exhalations from the earth. Perhaps their earthiness enables them to hold together in compact bodies (Anaximander's eddies of fire enclosed by mist are, it seems, rejected). They revolve around the earth. The earth is 'high' in the North, presumably putting the upper surface at an angle to the plane of revolution, as Anaximander had supposed, and so conceals the sun from our sight at night

⁶⁸This is an attempt to put the accounts in the various reports quoted in Kirk, Raven and Schofield together, assuming that "felting" is something different from "condensation"—it is presumably whatever happens in the process of making felt from wool or other fibers, so perhaps it involves the introduction of air in between thickened pieces of air, so that clouds, like snow (according to Aetius's report) are actually mixtures.

⁶⁹In general, we might note, a given substance is a gas at a higher temperature than it is a liquid, and a liquid at a higher temperature than it is a solid. As for wind, Anaximenes observed that when one condenses one's breath by blowing forcefully through pursed lips, the breath feels cooler than it does when he huffs with an open mouth.

⁷⁰There may be one stuff underlying each change, of course, without it being always the same stuff, so the argument is not a very good one. Of course, there are also other ways to account for change, even if we eschew supposing that some things arise, spontaneously or under suitable circumstances, from nothing at all, as modern Quantum Mechanics seems to allow. There may be many things which mix in various ways with one another without themselves suffering qualitative change, as we shall see Parmenides and Empedocles held. The Atomists seem to have agreed with Anaximenes that the one sort of stuff does not vary qualitatively, but only in place, but allow for a good deal more structure than is implicit in thickening and thinning out by taking it to occur in various shapes in the atoms. There is also no clear reason to rule out the possibility that, under given conditions, one sort of stuff may be replaced in a law-like way by another sort of stuff, which seems to be how Heraclitus looked at it, fire providing *exchanges* for all things, as he says. Diogenes of Apollonia did, it seems, think that all things *are* air, but his arguments for this view simply point up the likelihood that Anaximenes would not have gone so far.

even though it does not go ‘beneath’ the earth.⁷¹

Why did Anaximenes pick air as the original source of all things? It is a good candidate for an intermediate substance, leaning to neither side of any qualitative opposition, and also a good candidate for the Unlimited for which Anaximander had argued, since it seems from empirical observation that air extends indefinitely upward from the Earth. Perhaps more important, Anaximenes conceived a breath soul as what keeps the human fabric together and controls it (a traditional notion), and thought the world built on the same principle. We know too little of his thought to say if he conceived the world soul to have any knowledge, or the breath souls of human beings, drawn from the world soul as they are, to rejoin it at death. It seems likely he did, for these notions, derived from the traditional world view, were advanced, as we shall see, by Heraclitus, who followed Anaximenes closely in the main themes of his thought.

The Milesian position, then, from which all Greek speculation began, assumed an *arche*, a primary substance, which constitutes most of the stuff in the universe, and is the stuff from which the *kosmos* in which we live has arisen. All other sorts of stuff arises through some form of differentiation from this primary stuff, and in the end will be resolved back into it. Since the properties and behavior of natural things is due to the stuff from which they are made, all things share the most basic properties of this primary stuff, and all things have an underlying nature in common. Thus, phenomena not yet explained can be understood from what we have explained, and the microcosm is built on the same principles as the macrocosm, so that political society is built on the same basis as the natural world, for we also are made of this same fundamental stuff. It is assumed that phenomena occur due to the operation of a uniform natural process based in the nature of the fundamental stuff, a balanced interaction of opposites resulting in relatively persistent natural structures subject to cyclical dominance of the opposites making them up. No person lies behind this, and no one designed it or rules it. Finally, our cosmos arose by such processes from the undifferentiated fundamental stuff, and similar worlds arise and are destroyed periodically elsewhere in the infinite extent of this stuff. This has always been, and always will be, the way things are.⁷²

⁷¹It is suggested in Hippolytus that Anaximenes held “the stars do not move under the earth at all, as others suppose,” but this seems to be Hippolytus’s reading of the tilted earth hypothesis taken from Anaximander. We should read it to mean that they do not travel through underground caverns to get to the places where they rise in the morning. An alternative astronomical account in Aetius makes the stars shine by light reflected from the Sun below them—they are like nailheads fixed in a crystalline vault which forms the limits of this particular world system.

⁷²For this summary, Wedberg (1982), Sec. 3.

9. SCIENCE VS. RELIGION?

There is a reality behind the world as it appears to us, possibly a many-layered reality, of which the appearances are the outermost layers. what the great scientist does is boldly to guess, daringly to conjecture, what these inner realities are like. This is akin to myth making.

Karl Popper⁷³

We have just given an account of a momentous event, the origins of the European scientific tradition. But what is science? What began here? The natural move in answering this is to differentiate science from myth, or religious belief. Both deal with ultimate realities behind the everyday, practical things of which we are or can be immediately aware. The difference between them, one might suppose, is a matter of methodology, a difference in how we arrive at and justify our views. Science is, in the usual account, concerned with understanding the world, and so it takes what can be observed to be the case and explains it through causes that are not themselves observable, but only inferred from their explanatory power. The competition between scientific theories is rooted in their claim to explain, and in ideal scientific practice the theory that explains best wins out in the end. The most successful science not only explains what we observe, but even predicts what we will observe if we take the trouble, and so an alliance arises between science and technology, for the scientist helps us not only to understand old technology, but to design new technology that should work if his explanations are correct. The assumption throughout is that the best explanation is most likely to be true, and truth and explanation are the twin aims of the scientist.⁷⁴

⁷³*The Philosophy of Karl Popper*, p. 980.

⁷⁴One might take issue with this characterization of science. If science is seen as a matter of observation uncovering regularities in the natural order, and the formation of theories to explain the regularities is seen as mere window dressing, nothing essential to the process, or perhaps as an oblique way to express a wide range of regularities that have been uncovered, deducing some regularities from others—in that case, one might question if the Greeks had any talent for science at all. The one area where they did make careful observations was astronomy, but there they picked up on the Babylonian tradition rather than starting anything themselves. The Babylonians were interested in predicting celestial omens to predict important events, and about 1700 BCE they produced an account of the meaning of lunar eclipses and the like. We have a crude set of astronomical tables from 1100 BCE, and from around the 7th century observational astronomy was practiced assiduously and exhaustive records were kept. By about 250–50 BCE (after Plato and Aristotle) the tradition had become fully predictive, dealing with horizon phenomena, eclipses, and the stationary points in the movements of planets and the Sun. No theory of these movements was ever proposed by the Babylonians. Gomperz (1896), 143-44, suggests that a disciplined priesthood was needed to provide the necessary leisure, and the necessary continuity of tradition, for the accumulation of data, but hindered scientific speculation concerning its explanation, and so the Greeks, free of a ruling priesthood, heir to the Egyptian and Babylonian accumulations of data, were in an ideal position to launch scientific thought. The intense observational work of Tycho Brahe preceded Copernicus's advances in astronomy in early Modern Europe as well. For the Babylonian tradition see Aaboe (1974). We also note that the precise matter of early science, i.e. astronomy and geometry,

This procedure is rooted in our dealings with our everyday world, the world available to us for direct inspection. We hypothesize explanations, and then, often, upon taking a closer look, we actually see that the hypothesis was right (or wrong). We find that the explanation that promises to explain the most is more often the true one once we can take a look at what really is going on. Science hypothesizes boldly, inventing entities and explanatory stories more and more freely, and stories that it becomes harder and harder to imagine verifying through direct observation. The stories told about the sky by Anaximander are not as bold as such stories soon would be, among the Atomists, for instance. We cannot verify Anaximander's story by direct observation, and so we are thrown onto their explanatory power to support it, but this is only because we cannot fly out there to take a closer look. They refer to the sorts of things we can and do observe, and if we could fly out and take a look, they tell us what we would find. The Atomists were to propose stories that could not possibly be verified through the senses, and although they would be able to explain why this should be so, given their stories, this certainly reflects a level of daring beyond Anaximander.

In contrast with scientists, the priestly creators of myth might not be supposed to think of their tradition chiefly as a matter of coming up with the best explanation. They have other concerns to address with their stories, concerns science sets aside, many of which seem not to be addressed by seeking truth at all, indeed to be hostile to strict truth—literary quality and effective theater in their religious festivals, a comforting view of the world or (not necessarily the same thing) a response to the apparent senseless evils in the world, ideological justification of a political and economic system, imparting wisdom, the preservation of old traditions. Perhaps we observe among ourselves that doubters about the divine origins of myth who nonetheless approve of it do not generally propose some other reason to believe it, but rather slip into emphasizing its literary value, or its value for imparting wisdom, and so we assume that that was the real point of the myth all along.⁷⁵ But their behavior results from the remarkable success of science and historical

reflects the needs of the priesthood, who must settle the calendar for the purposes of agriculture, to which the cycle of religious festivals was then joined, and are in charge of temple architecture as well as land surveillance (keeping track of the possessions of the gods).

⁷⁵For instance, Armstrong (2005), 8–9, suggests, “It is, therefore, a mistake to regard myth as an inferior mode of thought, which can be cast aside when human beings have attained the age of reason. Mythology is not an early attempt at history, and does not claim that its tales are objective fact. Like a novel, an opera or ballet, myth is make-believe; it is a game that transfigures our fragmented, tragic world, and helps us to glimpse new possibilities by asking ‘what if?’ – a question which has also provoked some of our most important discoveries in philosophy, science and technology. The Neanderthals who prepared their dead companion for a new life were, perhaps, engaged in the same game of spiritual make-believe that is common to all mythmakers: ‘What if this world were not all there it? Would we become different? More complete? And, if did find that we were so transformed, would that not show our mythical belief was true in some way, that it was telling us something true about our humanity, even though we could not prove this rationally?’” For her discussion of the Greek scientific enlightenment and its understanding of myth, see pp. 97-103. Again, see

scholarship within our culture. They do not wish to abandon the old world view, at least they want to keep telling the old stories, but they no longer see a way to defend its truth from relevant evidence, and so resort to the claim that its truth is irrelevant to its value, or provide a pragmatic or relativist account of truth. We will encounter this sort of thing explicitly worked out soon enough in our history of philosophy. But this is a ‘sophisticated’ reaction to the modern situation, and most adherents of myth or a religious world view even today, and certainly those before the advent of science, expect its truth to undergird its other virtues.

The myths are true enough, they would say, else there would be no point relating them. Perhaps the truth is served up with a garnish. It may be intended only that somehow the world arose from primal waters which contain the source of life and action within them, but this will be expressed in a hundred different ways, every one an entertaining tale something like the truth. The literal account is rather too thin for presentation to the masses at a festival, and it must be developed into a good dramatic tale. So the details are filled in with marvels, drama, imagery, and a touch of humor and satire. In the Ancient world history was treated much the same way. It was the job of the historian to tell the truth, but if only a bare outline of the truth was known, he was expected to reconstruct the rest plausibly, and invent interesting and telling details making up a good story with an elevating moral. Even the historians most careful about the truth routinely made up speeches for their characters, expressing the sort of things they might well have said on the occasion, and revealing its universal character.⁷⁶ Indeed, we find scientists doing it, for instance, in Lucretius’s *On the Nature of Things*, in which he presents many explanations that he admits are merely speculative, but they are put in terms of atoms and the void, and that much must be right, and he wishes to keep it interesting for his audience. It is enough if he now and again confesses that this may not be right and other explanations (still in terms of atoms and the void, of course) are possible. To simply state the dry facts as they are known, very carefully adding nothing speculative, would not be to do history, not even natural history, or, indeed, to give a humanly recognizable account of things, at all. Truth does not require such dry, uninformative precision. Indeed, the mythographer, like the historian, thinks it requires a good deal more than such precision to reveal the truth about an occasion. We have

A.L. Herman (1983), 4–6, who speaks of myth as an attempt to describe the indescribable through an untranslatable metaphor (which is *not* to be taken literally, and can only be understood, as it is a complex metaphor, within its own culture, ritual practices and the like), “the myth is used as a vehicle to carry the participant to enlightenment through contact with, and experience of, the untranslatable metaphor.” The claim that is wanted is that the myth is true, but it is to be put to none of the tests a theory claiming truth is subjected to by the scientist or scholar, and so its truth is metaphorical and untranslatable. One can only recognize it by living it, and so a defender of myth that takes this line is likely to embrace a pragmatic theory of truth—it is true if and only if it is useful to believe it.

⁷⁶See here Gill and Wiseman (1993), especially the essays of J.L. Moles and T.P. Wiseman.

to reveal something of the thoughts and intentions that we can infer lay behind events.

The first work of the earliest scientists, then, was to distill out the parts of their mythological background that they perhaps thought intended to be true, and state it all literally without embroidery—that is to say, to state it without reference to any social or personal reality, without reference to intelligent agents, which these early naturalists took to be part of the allegorical embroidery, not the center of the tale. So they looked for what is *objectively* so, and tried to eliminate the elements of mere appearance, and merely personal or social import. In this way they could freely deploy their stated theories, intended to be the *exact* truth and referring only to physical (objective, mind-independent) processes, in explanation. The religious traditionalist, of course, would proceed rather differently, identifying the literal core of the myth as a story about persons and the social order of the world. Thus, in the hands of theologians, the myths evolved into sophisticated theologies, postulating all sorts of differences between the gods (or God) and human beings concealed behind the symbolic, anthropomorphic tales of the tradition. In the end, often, the physical side of the story, rather than the personal side, was dropped entirely as mere embroidery not literally intended to be true. A theologian would not talk about primal waters as purely physical entities, but rather about how truths about God are expressed in the account given of the primal waters. What about the original intention of the myth, before the scientist or theologian does her work? It refers to physical processes involving the primal waters, and it refers to gods with personality and intention. These would have been of equal importance to the original teller of the myth, and no doubt, he would have taken both as true, or something like it, if much embroidered for the sake of effective presentation. He was neither a proto-scientist, nor a proto-theologian, even if science and theology, in their different ways, each grew out of what he did.

So science and myth do not differ so much in methodology, as it turns out, as in their assumptions about what underlies and explains the world we observe. Scientists were, from the beginning, physicalists, who took the underlying explanations to be in terms of mechanical, chemical or biological processes, while the mythical viewpoint insisted on understanding the world as the result of mental activity, thought and purposeful willing. The scientist saw minds as somehow rooted in the behavior of animals, we might say, whereas the mythographer saw biological and physical events as somehow rooted in the activity of minds—not only minds, though, social minds with family connections and governmental structure—the humanity of the Gods, the fact, for instance, that Zeus’s chief problems in ruling the universe and keeping things on an even keel are problems with members of his own family, or close relatives like the Giants, who rebel against his authority. Only after political theory itself was rendered to some degree abstract, personal decisions and personal relationships being

removed from the causal factors considered, could it form a model for physical science. The attack on the anthropomorphism of the Homeric Gods we shall see made by figures such as Xenophanes are necessary to pave the road for scientific theorizing.⁷⁷

We observe among ourselves that those who hold to a religious world view often seem involved in self-deception, ignoring what are known to be the best methods for arriving at truth, even deliberately preferring faith to reason, in order to support ideology and comforting traditional beliefs. Recall the edifying belief that the chief was descended from the Lion-God. It would be nice if edifying beliefs were held purely because they are edifying, and those beliefs whose usefulness hang on accurate prediction what we shall encounter in the world, on their truth, were held purely on the basis of the evidence. In fact most of our more theoretical beliefs are in part edifying, and in part useful for prediction, in part held on the evidence, and in part defended from the evidence because of their edifying qualities. Perhaps most religious views are held, at bottom, because they are edifying, and, with the rise of modern science and modern scholarship the intellectual defenses of these views have crumbled, so that this is now apparent to fair-minded and well-informed observers. That does not mean that scientific views were not also held, at least in part, because they were edifying. Indeed, where our beliefs encounter practical concerns, there is still a continuing struggle to free science from the influence of those concerns, a struggle particularly evident in fields such as psychology and medicine. Nor does it mean that religious views in the beginning might not have been held (and still are held by many) because it seemed to people that the evidence supported them.

The argument that it must be true because it is edifying is almost never made except out of desperation, within a religious tradition under intellectual siege. The natural thing is to claim that it is true, it explains the world and is well supported by evidence, *and* it is important, because it is edifying. We may observe that religion is often as likely to give trouble to the ideologue, or the seeker after comfort, as is science. Not every edifying truth is comfortable, or supports the prevailing values and institutions. In the ancient Near East, religious myth led some to become prophets and social revolutionaries, and some to despair. Prophetic dreams and mystical experience are viewed as sources of truth in many religions, and they can lead to revolutionary new views as well as conservatism. Indeed, many a radical reform has evolved from a return to traditional religious roots. Moreover, the mythic world view of the ancient Near East, like most religious traditions, was in many ways not particularly comforting. The Mesopotamians and Greeks supposed, for

⁷⁷Hussey, "The Beginnings of Science and Philosophy in Archaic Greece," Ch. 1 in Gill and Pellegrin (2006).

instance, that nearly everyone, when they died, went to an unending existence as semi-conscious and impotent shades in the underworld—not a very reassuring view of the afterlife. In the Ancient world it was scientists and philosophers who traded in comforting views of life after death, not adherents of traditional mythology. The notion that science seeks the truth whereas religion does not is typical of an ideology that uses a scientific world view to support a way of life. “*We* seek the truth impartially, and it just happens to support our way of life, *they* are constructing a picture of the world out of whole cloth, with the sole intention of justifying their way of life, without regard to the truth, which their way of life could not bear to face”—or so one would like to think. It is of a piece with the notion that the adherents of a scientific world view are only trying to escape the recognition of their fundamental sinfulness. We do best to ignore such accusations on both sides. There is generally self-deception on both sides, but anyone whose thought is worth studying, scientist or priest, will go far enough to avoid such self-deception so that we can take them at their word that they do seek truth and understanding, and do think the most intelligent consideration of available evidence will lead to their views.

Moreover, the methods of Ancient religion for arriving at the truth were not all that misguided. The myths supposedly originated from the authoritative testimony of Gods and Spirits, whether in inspired dreams, or traditions handed down from the days when gods roamed the earth, or, among the Greeks, through inspiration from the Muses.⁷⁸ Preservation of the tradition unchanged is not just a matter of tradition, then, but important to preserving its truth. Explanation is not irrelevant to the interest of a myth, and in many cases it is fairly clear that explanation, perhaps of some circumstance of political power, of some fact about human

⁷⁸So Homer: “Tell me now, Muses, dwelling on Olympos, as you are heavenly and are everywhere, and everything is known to you, while we only hear the tales and never know...” (*Iliad* II 485 ff.) And Hesiod: “We [the Muses] know enough to make up convincing lies, but we also have the skill, when we’ve a mind, to speak the truth.” (*Theogony* 27-29) Poetic inspiration in Greece and the inspiration of the Prophets have the same source, an inpouring from a god. The muses are water nymphs, who might originally have poured a liquid or vapor into the lungs, wherein dwelt the breath soul, and somewhat like wine, it produces a kind of madness while imparting knowledge. (By a similar procedure great courage or strength can be temporarily imparted, and Homer tends to explain any action out of character for a man through the action of a suitable god, inspiring him. In effect one breath-soul is mingled with another, a breath soul containing knowledge or courage or wiliness, or whatever, with the breath-soul of the hero.) Inspiration is not infallible, since the Gods can deliberately deceive, and the prophet or poet can also mistake a sudden thought of a more ordinary kind for the inspiration of the God. Xenophanes points this out and draws a skeptical conclusion from it that may not follow (fragment 34): “No man knows, or ever will know, the truth about the gods and about everything of which I speak, for even if one chanced to say the complete truth, yet oneself knows it not, but seeming is wrought in all.” The Gods know all things because they were present as witnesses in the beginning, and are able to travel everywhere. There is no hint here of the inadequacy of our senses, or of any reality hidden from the senses, it is only that we are not old enough, and lack the right locomotive equipment. In Buddhism and some of the Vedic hymns it is suggested that the present generation of Gods *doesn’t* know about the beginnings of things, because they aren’t old enough! In later poetry, the knowledge of the Gods takes on a more “supernatural” cast: so Pindar, *Pythian Ode* III 28-30 refers to Apollo’s “all-knowing mind, which holds no traffic with lies: No god, no man deceives it either in word or intent.” A supernatural means of knowing is not mentioned, but to praise the god properly one uses superlatives which are not readily defended in naturalistic terms, and so a supernatural has to be postulated to defend the songs of praise as truthful.

relationships, of some inconvenient or apparently unjust aspect of the world, is one of the central points of myth. But if explanation was one aim of a myth, its explanatory power was not, as a theory's is for the scientist, generally taken as its guarantee of truth—the authority of the gods who gave it to us was.⁷⁹ On the other hand, in the budding new scientific tradition the authority of the gods was not advanced as the justification for believing its new, scientific stories—their explanatory power was.

What is the upshot? The new science and traditional Greek religion differed, not in one's seeking truth while the other sought other values, but in this: the religious tradition proposed a theory how things are that makes a certain commonplace way of discovering the truth the most reasonable one to follow in deep theoretic considerations, namely, reliance on traditions arising from contact with the gods. Science had a different account how things are, which suggests we do best to settle on those theories as true that do the best job of explaining what we have observed, another commonplace approach to discovering truth. In traditional religion, it was assumed that the world becomes intelligible to the extent that we can attribute events in it to agents with intelligible motives and intelligible plans for accomplishing their ends. The stories about the gods are just what is needed to make things intelligible, and sources of information that help with the enterprise need to inform us of social and personal realities, and the reports of other intelligent agents would, of course, play a large role here. On the other hand, it was assumed that there was a natural, impersonal and non-social environment within which intelligible action occurred, and so many natural events may not be intelligible, may not have any meaning or explanation. The scientist took the natural world to be intelligible, even though it did not depend on agents with their plans and motives, and so placed physical causation at the center of the story. He assumed that natural events, and the broad-scale structure of the natural world, were not random, and that even where physical explanations were not at all obvious, they still existed if one could only find them. The focus shifted from the social world, assumed to extend as far as possible to give the most extensive intelligibility to the world, to the natural world, and explanation in terms of the social world came to be used only when it was quite evident on the surface that intelligent agency and social structures were in fact responsible for events. Homer makes use of natural explanation on occasion, or simply leaves natural events unexplained, implying a natural explanation, but he introduces social and personal explanations for them where he can, and uses such explanations to account for the framework of the world. He also occasionally refers to the fates, who seem to

⁷⁹Given the fact that the Gods were known to lie on occasion, the God's authority was not enough to establish knowledge, though it was suggested that this was as close as we could get to knowledge. A prophet is inspired, but he may not speak the truth, and as long as a plausible motivation for falsehood could be imagined for the god, the prophet's failures would not be held against him.

have intentions, but whose motives and actions are entirely mysterious, though, like the natural world, unavoidable. Their actions underlie much of what is most mysterious, and most clearly without meaning, in the world. In particular, the fates seem to lie behind death. So Homer, and the other religious thinkers, resort to the social and personal when something is to be explained speculatively, in terms of unobservables, and they assume that there must be some way to find out about these social and personal events. The scientists pursue physical explanations without reference to persons in such situations, and assume, with equal audacity and equal lack of justification, that the world is such as to allow them to discover these physicalist explanations.

10. THE SUCCESS OF GREEK SCIENCE

The truth about the so-called ‘sacred disease’ [i.e. epilepsy] is as follows. It seems to me no more divine and no more sacred than other diseases. Rather, it has a nature and an explanation, but men have supposed it is something divine because they are inexperienced and prove to amazement, because it is not at all like other diseases.

On the Sacred Disease 1-2.

Each of these [diseases] has its own nature, and none comes about independently of nature. . . For when chance is examined it turns out to be nothing: for everything that comes to be is found to come to be from some cause, and in this cause chances turns out to have no reality but to be an empty name.

On Airs, Waters and Places, 22 and 26.⁸⁰

If science is viewed in terms of its aims, then, there was science around long before the Milesians, since there were theories accepted on the basis of their explanatory value long before the Milesians. Moreover, explanations were often enough of the everyday, naturalistic kind. The Mesopotamians, or for that matter the preliterate peoples that preceded them, did not deal in myths alone. Why are my pots cracking when I bake them in the new kiln? Why did my neighbor say those things? Why is there water dripping into the house? Why

⁸⁰Translations from Irwin (1989) 28-29. In *On the Sacred Disease* 18, the author says that epilepsy is no more divine than the other diseases, “it is rather that all are divine and all are human, and each of them has a nature and a power of its own, and none is hopeless or impossible to deal with.” The author even allows that there is a proper use of religious practices to remove pollution (of a moral sort), and that the Gods may, if properly beseeched, cure a person of a natural disease, but he insists that possession by a God, or some such thing, is not the source of epilepsy, for the Gods purify us of pollution, they do not produce it. He even suggests that prayer to the gods is an appropriate supplement to physical treatment, specifying which Gods it is more appropriate to seek help from in the different cases. For early medicine and philosophy, see Van der Eijk (2008).

are the dogs barking at this time of night? Such questions usually demand explanatory accounts not to be found within religious tradition, and the best way to find out their answers seems to be the scientific way—one might pray to the gods, hoping for the answer in a dream, or consult an oracle, but generally only if ‘science’ fails. In the same vein, we can observe that Thales, or the Pythagoreans after him, did not invent deductive reasoning or introduce its use into mathematics. The Egyptians and Mesopotamians used such reasoning before the Greeks did, though the flowering of Greek mathematics revealed in Euclid in the 5th century BCE involved a systematic and self-conscious application of deductive reasoning that we do not find before that time.⁸¹

In any case, Thales was not the first to assess his theory as true because it provided the best explanation, nor even, one would think, the first to apply naturalistic approaches to such large questions as the origin and structure of the cosmos. Rather, his importance is that he stands at the head of our current scientific tradition. His views were criticized and modified by Anaximander, and Anaximenes criticized Anaximander in turn. Science is competitive, and aims to be progressive. The scientist always strives to learn more than his predecessors, to criticize and modify their views in order to improve them. Or at least Greek science and its heirs are competitive. The remains of Egyptian and Babylonian medicine and astronomy, for instance, provide us with not a single example of an author criticizing the views of another, and proposing new views in their place. What is important here is the beginnings of the argument leading eventually to modern science, with its accumulation of observations and theoretical resources, its ever more sophisticated techniques of reasoning and observation, its continuous modification of old views and reinterpretation of old observations, all in the search for improved explanation of wider and wider ranges of phenomena. Thales set a particular cooperative project afoot, a search for ever better theories to account for the world, and that search continues. No other such continuous cooperative effort has shown anything like the success of this one. Some independent efforts, in China and India, and no doubt elsewhere, had some success and achieved some sophistication, but all these have either come to an end with the collapse of their supporting cultures, or merged with the dominant Western tradition in science.

One must be careful in projecting the later stages of this development back to the beginning. Most of the theories of these early scientists were perforce far too schematic to allow for any kind of experimental testing, or even any very detailed explanation of everyday observations, even if it is clear that they aimed at such explanation as their ideal. In any area of investigation theories must first be set forth in broad strokes, and

⁸¹For this see Sherry (1999).

sit quite loosely on the phenomena, so that it is all but impossible to see any decisive reason why one theory explains them better than another. As we shall see, at first arguments center on internal coherence and fit with one's world view, and *a priori* reasoning of every sort prevails. With prolonged discussion truly promising theories eventually emerged, and their fit to the phenomena is tightened up over time, and then theories begin to drop away as investigators despair of getting a competitive tightness of fit for them. Thus the field gradually drifts into its first bout of "normal science," with a single dominant theory, and the fit to observation, now deliberately expanded through natural history and experimentation, continually made more detailed and precise.⁸²

Moreover, Greek science, lying as it did at the beginning, never got far from the rationalization of popular belief.⁸³ Indeed, where else could science begin? And how quickly could it move away from its starting point? Science approaches the truth by revising existing notions. A fairly complete world view must be in place to develop a criticism of any given belief, even when that criticism rests on observation. This is because observation must generally be put together with the whole world view, not merely the belief under attack, to derive the implausible consequences that lead to rejection of a questionable belief. Thus a world view, under the pressure of new observation, only gradually transforms itself into something more adequate. The only world view science could have begun from in Greece was the commonly accepted, pre-scientific world view in Greece. At most Greek scientists could be faulted for failing to move away from their starting point as quickly as the their observations warranted, and that may be a difficult charge to sustain if we are careful to place those observations within the context of their knowledge and assumptions and not our own. No doubt they were unaware just how far they had to go before a world view could be developed that would remain relatively stable under the pressure of careful observation. They thought their traditional world view was about right, and only needed a few adjustments, and a purification from the fancies introduced in myth.

But with all these handicaps, Greek science did enjoy some immediate success of the spectacular kind,

⁸²See Vlastos (1955). The term "normal science" is borrowed from Thomas Kuhn's work. Kuhn argues that normal science generally leads to a crisis of confidence, as "anomalies," observations that cannot be explained and problems that cannot be solved, accumulate, and scientists come to think that this is not due to their own failures to understand but to the falsehood of the dominant theory. A new theory may then be proposed that reinterprets all previous work and solves or makes irrelevant most of the anomalies that have accumulated, and if this new theory becomes the new "paradigm" or dominant theory, replacing the old, the field will have worked its way through its first "scientific revolution." The picture is rather political. The "pre-paradigmatic" stage (from which it may be Philosophy has yet to emerge) is like pre-civilized, more or less anarchic, cultures, with no single center of power. A revolution only becomes possible once there is a centralized government, a single center of power, which is like the stage of normal science, and a revolution results, not in anarchy, but in a new center of power, a new government.

⁸³I borrow the phrase from G.E.R. Lloyd (1983), p. 202.

and that was important to its survival.

This is not so evident if one looks at the question what the fundamental stuff making up the world is. Thales, following tradition, made it water, and Anaximander argued that water could not be the source of all things, or else all things would have long ago become water alone, all fire being extinguished, and all the earth dissolved. Anaximenes in turn argued that stuff never simply vanishes into nothing, but rather must be converted into another sort of stuff. The discussion was thus caught up in the effort to avoid conflict with plausible principles presumably known quite independently of experience, in particular, with the principle that there is always a cause, so that nothing is utterly destroyed or arises from nothing at all. The observations to be explained included the silting of harbors, evaporation and condensation of water, the formation of clouds, wind and rain coming from those clouds, and so on. But other theories than these three could be advanced to explain such things. We shall see a dozen more advanced by the Greeks, and nothing in the phenomena really showed one superior to the others.

But the same impasse did not occur everywhere. Astronomy was quite progressive from the beginning. It began with Anaximander's theory,⁸⁴ which, though clearly designed to explain what he could observe, seems rather quaint to us. The true cause of eclipses and the phases of the moon, that the moon shone by reflected light and that the earth was spherical, were all postulated by Parmenides within a century, and became well established as far and away the best explanations anyone could find of the phenomena by the time of Plato.⁸⁵ To make the new views work, the stars were moved very far away, with the Moon and the Sun close in to the Earth. A few hundred years later the Greeks had even worked out, using basic observational instruments and a sophisticated geometrical expertise, the size of the Earth and the relative distances of the sun and moon, simply by considering what must be true to explain the observed phenomena. In mathematics the Greeks hit on an entirely new method of investigation, when they found that some hypotheses seemed to contradict, not the observed phenomena, but themselves, and logical techniques of proof rooted in arguments that it must be true, or else impossibilities resulted, opened up a brand new landscape in geometry and arithmetic. Thus one

⁸⁴Or perhaps with Thales's views, if he in fact held the earth to be spherical.

⁸⁵The cause of solar eclipses is rather more obvious, and we have noted that it was probably already known to Anaximander, if not Thales. It is noteworthy that Aristotle, looking for prime examples of scientific knowledge of the explanations for events, for analysis in his *Posterior Analytics* II 7-12, takes up the eclipse of the moon, and the cause of thunder (extinction of fire in a cloud, making a noise, as extinction of fire by water does). He notes alternative explanations in the case of the eclipse, that the moon might rotate, or be extinguished. In both cases, it should be noted, if we were in a position to observe the thing more closely, the cause would be obvious. There does not seem to be, in Aristotle's view, any necessity to discover or postulate new kinds of things, and he tends to resist any suggestion that we do so, as occurs, for instance, in Atomism.

could hope that mathematical logic could somehow be turned to effect in the natural sciences, if one just worked hard enough to explain as much as one could in as much detail as possible, while still preserving consistency in one's views. Indeed, it seemed that this approach was already working in astronomy. It was above all the evident success of mathematical and astronomical investigations that lent credence to Greek science and assured its continuation.⁸⁶ That success included, we should note, technological applications, for even an ordinary fellow can be impressed by the successful predictions of the architect, engineer, surveyor and navigator, not to mention the banker, and if he is told mathematics lay behind it all, he has reason to think that mathematicians know something. If it was convincing in these areas, that promised the possibility of understanding elsewhere.

Since science, like religious myth, undertakes to tell us what is really going on in the world, it is not surprising that, from the beginning, the theories science provides have been used, legitimately or not, to justify one or another way of life. Surely we can see how we ought to conduct ourselves if we can only see what is really going on, how the world is really put together and how it works. Still, science has not always supported the same way of life, nor has it always been opposed to religion. The warfare between science and religion is an intermittent thing. It is rooted in no irreconcilable differences of method or belief, for one might well accept, as Thomas Aquinas did in 13th-century Europe, that the differing methods are complementary and equally effective, and lead, in the areas both address, to the same beliefs. When such warfare occurs the world view of *this* science opposes the world view of *that* religion. Science is, in every age, enlisted in the service of a way of life, just as religion is. And it should perhaps be added that religion and science are equally problematic enlistees, for their methods lead them sometimes to abandon the world view that is wanted.

Science, then, proposes a picture of the fundamental structure and causal processes of the world, a picture which often can be used to justify a way of life, and asserts its truth on the ground of its explanatory power.⁸⁷ Science became established in part because some such picture, justifying a new way of life, was

⁸⁶Nothing like the success of Greek astronomy occurred in the ancient scientific traditions of China and India, nor did these cultures have any other similar success to compare with it. By the time of Plato Greek theoretical science was already preeminent in the world.

⁸⁷It should be noted that scientists *also* make unusual observations, to find more to explain and so narrow down what might be a good explanation, though this evolves from simply taking a closer look at what is going on. The astronomer observes (and records) the precise time of rising and setting of heavenly bodies, the foundation of astronomical theory in the beginning, or a physician performs dissections, observes an aborted fetus, or studies the development of chicken embryos (analogizing them to the human) by opening up or candling eggs at each day in their development, a procedure reported by Aristotle, but also in the Hippocratic work *On the Nature of the Child*.

wanted, and the resources of myth seemed unable to provide it. One problem may have been that new myths could not be constructed as easily as before, because of the introduction of the widespread use of writing at just about this time.⁸⁸ Writing, of course, helped make the scientific tradition possible, for scientific work can advance only so far if it must rely on oral tradition. Only so many observations can be remembered,⁸⁹ and theories can reach only a certain limited level of complexity.⁹⁰ But it may be that the most important impact of writing was not what it made possible, but what it made impossible. The mythological tradition could no longer transform itself to meet new conditions. New myths could not be constructed, and then provided with a proper sense of antiquity, for anyone reading Homer and Hesiod would immediately detect the imposture.⁹¹ Creativity is possible within a mythological tradition only as long as forgetfulness is possible. In other times and places the problem of renewing and changing such a tradition was resolved by bold fraud, the “discovery” of *Deuteronomy* hidden in the temple by Josiah, or of new sacred texts by Mahayana Buddhists, texts supposedly preserved in the Heavens until the proper time for them to be revealed. But the Greeks found another solution to the problem. They created a new sort of tradition, not based on the preserved accounts of eye witnesses at all, to provide the new world view.

But the new tradition drew on the old. We have observed how some of the gods remained, in a depersonalized form, as universal natural forces. The stuff making up the world was divine, as were the primal waters in some of the myths, for they were the body of a slain or sleeping deity, still retaining the power of life within it. Justice had been a goddess associated with Zeus before Anaximander pressed her into the service

⁸⁸Ellis (1963) observes that the Greek alphabet appears no earlier than the 8th century, and it can probably be placed in the beginning of the 7th. It seems likely, as Gomperz (1896) observes, that the opening of trade with Egypt under Psammetichus I in the 7th century provided a convenient medium for written communication, papyrus, which enabled writing to spread and become established.

⁸⁹Even if we insist that the observations be easily made and recorded by anyone, and even repeatable if we want to check on them.

⁹⁰Abstraction is probably not at issue. Homeric Greek has a tenseless “is,” for instance, and even Tyrtaeos provides definitions of a sort. Pre-literate cultures seem to express abstract notions quite as readily as concrete notions.

⁹¹We know the *Iliad* and *Odyssey* to have been written down about 550 BCE, several centuries after writing was introduced to Greece, and presumably one or two centuries after their composition. Reading became commonplace, it seems, being taught to large numbers of boys in public schools, and to upper class women at home, by 500 BCE (Casson (2001) 19–23) The shift from an oral to a written culture is apparent in the works of the Pre-Socratics, which begin with brief and easily remembered oral forms, poetry, stories, pithy sayings, and evolve into prose only in the 5th century in Melissus, Anaxagoras, and Diogenes of Apollonia. By way of comparison, the Milesians date to the 6th century, and Solon, whose poetry reflects a well-developed version of the new ideology, was in Athens around 600. So if we can assume the chilling effect of writing on mythic creativity as early as, say, 650, that would support the theory.

of abstract natural law. Moreover, the new tradition, like the old, saw the world at large as an essentially social order modeled on the dominant social order in human life. Science, like myth, is concerned to explain what goes on in the world from the standpoint of universal, basic causal principles, and the fundamental, underlying structure of things.⁹² It is not a matter of explaining small matters like the neighbor's odd activities, using causal principles of narrow application—say, that the guilty flee when no one pursues. This has become somewhat obscured for us today, since science has taken over some of this piecemeal work. We are likely to imagine that a psychologist can do a really good job of explaining our neighbor's oddities, deducing our paltry little principle from a fundamental understanding of what human nature really is, and perhaps suggesting other useful principles, just as narrow, that we would never have suspected were true. But this has occurred because science has at last succeeded in connecting the fundamental structures and laws it finds in the world to our mundane and localized concerns, not because science itself is primarily interested in such concerns. Now we can make use of science to discover how we might accomplish our everyday aims. The scientist takes this, reasonably, as confirmation that she is on the right track. But her purpose, often, at least, is to understand the world, the world at large, not to deal with our practical concerns.

Again like myth, the scientific tradition postulates a reality behind the immediately accessible surface realities of everyday life. The gods, mysterious forces behind the scenes, undetectable by ordinary means, but nonetheless responsible for the play of events observable by us on the sensible surface of things, lose their personalities. The stories about their quasi-human affairs become theories, but the central notion of mythical explanation, foreign to the common sense style of explanation that posits no intervening, theoretical entities, remains—there is another world behind this one, a world that cannot be detected by the senses, and events in that world parallel, produce and explain the events in this one. One of the central problems of philosophy, from its beginnings to the present day, is understanding the connection between these two worlds, and the reasons for believing the world behind sensible appearances exists at all. Science may transform mythical stories, seeking new justifications for myth of quite another genre, but it does not reject mythical stories altogether.

⁹²The Hippocratic corpus, we might note, often deploys a sophisticated vocabulary of causal terms, clearly distinguishing underlying causes from symptoms, and employing especially the notion of a *dynamis* or power, typically assigned to some stuff taken into or applied to the body, which has the power to purge, dry out, moisten, or whatever. In *On Ancient Medicine* 19, a cause (*aition*) is defined as “that as a result of whose presence something happens necessarily in this particular way and by whose change into a different mixture it stops.” In *On Sacred Diseases* 3 a *prophasis* is distinguished from *aition*, the *prophasis* being a background condition, climate, diet or whatever, for the operation of the *aition*.

It is not to be imagined that the Greeks entirely abandoned religion for science. The scientific ideology spread, and there came a point at which most intelligent and best educated viewed the religious myths with considerable skepticism. But the framework of custom provided by religious practice that pervaded every area of society could not be abandoned, nor, for many people, especially among the less educated, could the consolations of prayer, magic, and sacrifice. The scientific ideology was intended for the leaders of the new states, the educated elite. Education in this scientific world view provided them with the authority of the “expert,” the fellow like Thales, the wise man who sees how the state must be run, thus providing a replacement for the older authority of noble lineage, and a justification for their rule. They were simply working with the nature of things in their political contrivances, a nature they understood because of their scientific education, and guaranteeing stability as best they could by meeting the demands of justice, something that even the old myths granted to be a good thing sought by the gods.

Indeed, the early Greek scientists often had their own religious vision, and made the natural world something divine. Their divinities worked through natural law, not in violation of it through supernatural power, and given the coherence and consistency of natural law, the scientist tended to postulate a single, all powerful and all-knowing, god. Moreover, their divine beings had no connection to the public cult, and one could consistently adhere to the philosopher’s god while rejecting the public ritual as irrational and even unjust. Part of the strategy for undermining the authority of the old ways, and open up the possibility of a modern state, was to attack the old rituals, or at least the most politically significant of them. The attack was effective enough so that no one of any sophistication accepted the old religion at its face value after the 4th century BCE. The use of epithets such as “divine” of their cosmic principles, and the presentation of their views in poetic and prose forms characteristic of religious discussions, marked the religious seriousness of the philosopher’s views. They had to take themselves as seriously as the traditional religious views they undermined did. Indeed, it did not hurt if the criticism of these older views took on an air of injured piety, as it did in Xenophanes. Even after the old religion was no longer a factor, the habitual religious gravity of the philosopher persisted to mark the seriousness of his enterprise in a world that often thought it rather silly.⁹³

The conflict between Greek traditional religion and science was worked out in a number of arenas. The early philosophers, except for the Pythagoreans, rejected the popular notion that the heavenly bodies were

⁹³The religious language applied to the first principles of things lent them a certain philosophical status, as well, for if air is divine, as Anaximenes has it, then it is absurd (and impious) to look behind air for more basic principles. It can safely be asserted that it behaves as it does without worrying about providing an explanation why it does. The ultimate is always divine. For all this, see Broadie (1999).

gods, for instance, and skepticism on this score was automatically attributed to any intellectual known to be interested in science.⁹⁴ But the conflict was most obvious in medicine, and there we can see just how slender the advantages of science were in the beginning. In the course of the 5th century, the Hippocratic school, a scientific tradition of medicine depending on the new philosophy, arose in opposition to the priestly physicians of the temples.⁹⁵ It found the cause of disease in an imbalance among the opposed powers that ruled the human body. The four seasons, representing an alternation of dominance of four powers, hot and cold, dry and moist, were thought to balance the powers of the body by allowing each to dominate temporarily over the others in rotation over the year, thus preserving equality along democratic lines of government with its rotation of offices among the people.⁹⁶ If a person sought help from the priests, he might sleep in the temple, expecting an advisory dream, perhaps helping things along through ascetic or meditative practice, or he might consult an oracle.⁹⁷ What if he sought help from the scientist? A regimen involving diet, purgings, and the like, to balance the forces in the body, would be suggested. One of these scientific physicians, the author of *On the Sacred Disease*, writing around 400 BCE, argued that no disease arises from the Gods, that even epilepsy, the so-called “sacred disease,” has purely natural causes, and so it was useless to attempt magical or religious cures of the disease. But his account of the causes of epilepsy was entirely wrong, of course,⁹⁸ and it is impossible that his suggested regimen could have done any good at all. Not that he didn’t, like all scientific physicians, argue for his theories on the basis of the clinical effectiveness of treatments based on them, but the priests argued for their own views the same way, and very likely could demonstrate effectiveness just as readily.⁹⁹ The Hippocratic

⁹⁴*Apology* 26cd, where Socrates denies the charge in his own case; Plato, *Laws* 967a states that the popular view is that the study of astronomy leads to atheism. Again, see Plutarch, *Nicias* 23.

⁹⁵See Van der Eijk (2008). It is probably overstating things to claim that the Hippocratic writings belong to a single school, though they are all in Ionic dialect, and connected to the island of Cos. The collection was no doubt consolidated later (in Cos?), focusing on those writings which seemed to be of most practical use.

⁹⁶See Vlastos (1947), section I. See especially *On the nature of Man*, but also *On Airs, Waters and Places*, and the ideas of Alcmaeon, a physician associated with the Pythagoreans who lies at the head of the tradition.

⁹⁷The Hippocratic treatise *On Regimen* suggests that some dreams are sent by the gods with messages relevant to individuals and cities, but that the physician is interested in dreams that arise from the body, and contain clues to the sickness producing them. These clues are interpretable if one understands how dreams arise from the body, and the physician has a special expertise in interpreting them.

⁹⁸He thought that an excessive accumulation of phlegm at the exits to the brain interfered with the transmission of the vital controlling breath to the rest of the body. The accumulation would be due to a congenital malformation.

⁹⁹For the paragraph up to this point, see Lloyd (1979) Chapter 1.

pointed out that the priests papered over their failures with *ad hoc* explanations why beseeching the gods might not have availed in this case or that, but, of course, he himself provided similarly *ad hoc* explanations why his treatments, based on natural causal theory, failed in this case or that, as they often did. The naturalistic hypothesis would eventually establish itself on the evidence, but in the beginning it was an assumption only, nothing proved.

The rejection of supposedly unrepeatably observations preserved in the historic tradition as a means of justification in science has an ideological bent. It squares quite nicely with the new political realities, in which authority is no longer to be relied on, and negotiation and successful adaptation to conflicting claims is the real test of worthwhile political expedient. Scientist and philosophers were trained in the invention of theories by the practice of constitutional innovation, and in the free interchange of views and their critical examination and the expectation of receiving justification for views advanced by the debates in the political assemblies and the law courts. The very fluidity of the new system, its constitution repeatedly altered in the search for the right balance among the classes, is sympathetic with the fluidity of science, constantly altering and adapting its conclusions to new arguments, new theoretical suggestions, and new observations.¹⁰⁰ Henceforth, reasoned innovation was to be the order of the day, and the new science would justify that order.

11. THE RELIGIOUS BACKGROUND TO GREEK SCIENCE

From the beginning everyone has learned according to Homer.

Xenophanes, Fragment 10

Let us take a closer look at the religious tradition to which the scientific naturalism of the Ionians opposed itself, for the Greeks of the 6th century BCE were not the Mesopotamians of the 2nd millennium, and the new Greek science in fact extended developments that had already found a place within Greek religion.¹⁰¹

¹⁰⁰Laws establishing a constitution were in fact a peculiarly Greek institution in the Eastern Mediterranean. Laws in the Middle Eastern states were restricted to statutes, and the constitution rested in custom. The notion that the constitution could be invented and revised led to an efflorescence of political improvisation, and the attempt of Aristotle and others in the 4th century to analyze and classify the huge range of polities produced in the various city-states. All of this was quite as unusual as Greek science, mathematics and philosophy. For all this, Lloyd (1979) 246–264, who especially identifies the political institution as the training ground for scientific inquiry.

¹⁰¹See Kirk (1974) for the nature of Greek myth. For Greek religion in general, see Guthrie (1949).

In the first place, the political and ethical views found in the Ionians were not in themselves new, even if they gained a new theoretical basis in the thought of Anaximander. They are expressed in the works of **Homer and Hesiod**, who gave the city-states of Greece their common religion and mythology, and were spread and established by the temple of Apollo at Delphi, which had, by historic times, become the regulatory center for the rituals of the great gods whose mythology was systematized by the poets. Not only did every new colonial venture go there to receive its rites, but established cities often invited Delphic officials to supervise the purification of the community from blood guilt, and settle disputes over the conduct of local cults. The temple opposed especially blood feuds, providing purificatory ceremonies for those involved in accidental killings, while making the penalties for deliberate murder so severe that but few were any longer willing to kill even in revenge for the death of a relative. Many of the blood feuds had a political side. When one influential family contested leadership of the state with another, the competition might break into open warfare. Clan rivalries posed the central problem for the new order, which, in theory, at least, aimed to eliminate family loyalties in favor of the individual's loyalty directly to the city-state. Due in considerable part to pressure from Delphi, banishment voted by the assembly eventually replaced the killing of dangerous opponents of the ruling families, a solution to the problem that became characteristic of Greek politics.

The ethic preached by the Delphic Apollo was reflected in the inscriptions on his temple, of which “know thyself” and “nothing too much” are the most noted. It enjoined awareness of one's place and limitations, and proscribed overreaching oneself and falling into injustice. The poet **Pindar (ca. 518–ca. 438 BCE)** makes much of the theme, telling the story of Asklepios, for instance, who was induced by rich payments to raise a man from the dead, and promptly incinerated by Zeus for his presumption. Deathlessness is the lot of the Gods, not of human beings, and “we must ask from the Gods things suited to hearts that shall die, knowing the path we are in, the nature of our lot.”¹⁰² The *Histories* of **Herodotus (5th century BCE)** are full of stories, many from records kept at Delphi, of tyrants who overreached themselves and came to a bad end. The priests even reprimanded rulers for making gifts to the temple too abundantly. This emphasis is a natural development in Ancient polytheism, ultimately rooted in the observation that overreaching in one's social role brings trouble, the world at large being understood as a social order with the gods at the top. Anaximander transforms the theme, providing an explanation and justification for the social and political order that opens up the possibility

¹⁰²Pindar, *Pythian Ode* III 53–60. So also *Isthmian Ode* I 13–17, “mortal aims befit mortal men,” and *Pythian Ode* XII 29–35. *Pythian* VII, in famous lines, “Creatures for a day! What is a man? What is he not? A dream of a shadow is our mortal being. But when there comes to men a gleam of splendor given in heaven, then rests on them a light of glory and blessed are their days.”

of deliberate constitutional design.

When the works of Homer and Hesiod were composed in the 8th and 7th centuries, kingship had already ceased to be a force in Greece, and myth had become detached from the ritual of kingship, which had disappeared with the political institution it supported. Homer looks back to a time when Kings were not bound by laws, but that time is past. The Homeric tradition developed as a common tradition in Greece, for it was spread through the great festivals and games in which allied cities met, and so it drew, not on local traditions and rites, but on what the attendees at the festival could be assumed to have in common. This was particularly the case at the Olympian games, which began in 776. The Homeric rhapsodes performed in sacred contests at these festivals, traveling from place to place reciting the poems that were (or at least came to be) the common property of all the Greeks. This common Greek mythology,¹⁰³ at least by the time it was written down in the 6th century, provided much less than did the myths of Mesopotamia to justify specific political and social institutions.¹⁰⁴ The Olympian Gods were conquerors, like the Achaians who brought them to Greece from the North, and so the myths about the origins of things are myths of conquest, not creation. The great gods of nature, such as Uranus and Gaia (Sky and Earth), fall into the background, supplanted by their conqueror Zeus and his relatives, and they lose most of their personality—no tales were told of them that do not easily translate into cosmogonic and cosmological terms. In contrast, the stories about Zeus and his generation of gods, though fully personal, generally tell us nothing about why the world is the way it is.¹⁰⁵ They perform their actions within the existing world order—they do not create it. These myths satisfy curiosity, and entertain, and there is enough preserved to show that they once did more, but the world view of the Ionian scientists did not replace a truly mythological account of the origin of the world. The removal of all personality from the older gods, making them into natural forces and the laws governing their interaction, completed a

¹⁰³It should be noted that the mythology *needed* to be common, for the function of the festivals was to promote unity, and so the twelve Homeric Gods were assimilated to local traditions as necessary so that the visitors to the festivals could identify their gods in those about whom the stories were recited at the festivals. Of course, the themes of such poetry would be found in common efforts made by all the Greeks, and the Trojan War was a natural choice. A rationalization and homogenization of the old traditions in the various cities was inevitable. One finds something similar, as we shall note, in the development of the Hebraic religion.

¹⁰⁴That is not to say it was not used to justify political claims. The Athenian edition of Homer put together under the Pisistratids became the universal edition, and it had material in it that justified the Athenian claim to Salamis over and against Aegina's. The Aeginetans claimed the relevant passages had been forged.

¹⁰⁵Of course, the story of Zeus and his brother's conquest of the older Gods are an exception here. This is the story of the origin of the world. For instance, Zeus castrates Saturn and he flees from his conjugal embrace with Gaia, the Earth, and thus in the space that opens between the two the new world order can take form, and Gaia's children have room to live. Here Zeus is a cosmogonic figure.

process already well advanced within the mythological tradition itself.

This is particularly evident in **Hesiod's *Theogony***, which professes to give an accurate account of the origins of the gods and the world. The primary intention is to give an account of the gods that are honored in the public cults, of course, which is why Hesiod is placed by Aristotle and Plato among those who write about the gods, *theologoi*, not those who writes about nature, *physiologoi*, even if views about nature can be attributed to him.¹⁰⁶ Hesiod notes his intentions right in the beginning of the poem, when the Muses say, "We can say much false that resembles the real; but, if we desire, we can also proclaim the truth."¹⁰⁷ He makes the first being from which all else arose Chaos, a vast, empty space filled with storms and disorder, and the genealogical scheme that follows presents an account of the great powers in the world and their dependence on, and development out of, one another. There is nothing of personal history in its beginnings. Earth gives birth to the Heavens, to mountains, and so on, as the underlying potentialities of the original beings are realized in their offspring. The structure of his genealogies rests on the nature of the natural forces and the great natural beings represented in them, not on traditional anthropomorphic tales about the doings of the gods. With Zeus, order is imposed on these warring powers, and he assigns the rulership of each region and each great power to his offspring and siblings, bringing reason and organization to the world in the form of a political order imposed by force.

Despite this political order imposed by Zeus, the Ionian scientists did not replace a persisting mythology of kingship, either. Even the generations of Zeus and his offspring, for all their rich personality, become abstractions when we turn to the moral and political sphere. The Olympians of Homer are the common possession of all Greece, and so the common religion of Homer and Delphi provided little more than a blanket authorization for government in general. That was all it could do, given the number and variety of states it had to conform to. The common tradition was no doubt at one time quite particular and circumstantial, but it left that behind in the North when the Achaians came to Greece. There was a political mythology left over in each city from before the Achaian conquerors arrived, but it ill fit the new realities in politics. Emphasizing the common tradition of Homer and Delphi, the new men of the 8th and 7th centuries pushed the local myths into the background. There, with the old rituals of kingship, they remained, less and less understood, preserved in piety, but playing no role in actual political thought.

¹⁰⁶Aristotle, *Metaphysics* I 3, 983b29 ff.; Plato, *Laws* X, 886cd.

¹⁰⁷*Theogony*, ll. 27-28. For the remarks here on Hesiod, see Ricken (1999) 4-6, where the translations of Hesiod here are to be found.

The Greek gods, then, and especially Zeus, the King of the Gods, showed an interest in furthering justice in the world, an interest left over from earlier more political functions, but the justice that interested them was universal and abstract, not tied to the practices or laws of a particular state or even a particular form of government. Gods and human beings were politically independent of one another, and the relation between a city and its tutelary god or goddess had been transformed from ownership to patronage.¹⁰⁸ The deity rejoiced in the city's successes and the honor showed it in the sacrificial ritual, and provided aid, or intervened with Zeus or the other gods, when necessary, but it did not provide the city's laws or institutions. Zeus in particular was supposed to punish injustice, though Homer, because of the plots of his poems, portrays Zeus as specializing in violations of hospitality. The Furies punished violations of parents' rights, and other gods and goddesses punished unjust acts against their favorites, so that Hera, for instance, the patron goddess of wives and marriage, punished infidelity on the part of husbands.

Zeus imposed his justice on a pre-existing order of things that was chaotic and unformed. Thus the natural law ruling the natural order is distinguished from and stands outside the natures of the great world masses of fire, earth, water and air governed by them, the conception we find in Anaximander. Things do not order themselves—they are ordered by external force. On the other hand Zeus also violates the natural order to impose and enforce justice, interfering in natural events to accomplish his personal aims, and his justice generally represents a supplement to the natural order of events, not its underlying cause.¹⁰⁹ The justice of Anaximander is no longer associated with a person, or with miraculous interventions. It is the law of nature.

In Hesiod Zeus punishes especially the sort of injustice that overreaches itself and causes a person to forget who he is. Originally this divine justice supported the *status quo*, insisting that the lower classes keep their place, and conservative oligarches later used the old notions to criticize democracy. But if one's place were defined by those just privileges and duties that, if recognized, would give stability to the state, Zeus's justice could be turned to use by the new world view. The advice would be to restrain the natural desire for absolute domination to the limits of what was just, just limits being set, not by traditional standards, which might need revision, but by consideration what would bring lasting peace. Thus the limits of justice become a matter for

¹⁰⁸It seems likely that the Achaeans had never seen the gods as owning them, or ruling them directly, since they never had the class structure of the river valley civilizations in Mesopotamia and Egypt. Perhaps the notion had not even penetrated into the rain-land cultures of the Mediterranean before the Achaeans arrived, but if it had, they evidently had no notion what to make of it, and there is almost nothing of it in Greek mythology.

¹⁰⁹Argued in particular in Vlastos (1952).

negotiation and legislation, preparing the way for the conventionalist views of the Sophists in the 5th century.

The personality of the gods remained in the background even in these matters of justice. In the end, retribution occurred by natural law. The Greek mind saw a deity behind every natural process, and it saw the King of the Gods behind the natural process that punishes those who overreach themselves. Perhaps this process, in Homer as well as Anaximander, underlay the operation of the world as a whole. It is to be noted that the early Greek view of justice does not have much of the reformer in it. Justice required the recognition of rights and privileges for each position in society suited to the contribution of that position to the security and welfare of the whole, but justice certainly did not demand society's reorganization. It required no more than the correct operation of the existing social organization.¹¹⁰ Nor does one find miraculous intervention from the outside to insure that the unjust suffer and the just are rewarded, for Zeus's actions are not miracles, but a part of nature. If one harms or callously fails to aid the poor and downtrodden, Zeus will not appear in glory hurling thunderbolts. Rather, the character that leads a person to such behavior will work to his ill, for we overreach if we imagine we can never suffer misfortune and poverty ourselves. When such a person stands in need, as he inevitably will, no one will aid him.¹¹¹

Thus the idiosyncratic laws of the city come to be supplemented by general moral injunctions, with sanctions provided, not by the government, or the god, but the inescapable nature of society and human affairs. The existence of such a general moral law had no doubt always been envisioned, and we must not suppose that we have uncovered here the invention of a moral law outside the positive law of the state. Nonetheless, in the civilizations preceding the Greeks the general requirements of justice and the particular laws of the state were both ascribed to the legislation of the god. The awareness of the almost improvisational nature of the city-state's law in Greece produced a new awareness of more universal standards of morality and justice, and prepared the way for a philosophical ethic independent of, and underlying, political thought.

¹¹⁰Lloyd-Jones (1971) argues that what we might call social justice was not part of the Greek concept of justice, and so the Olympians' lack of interest in social justice does not show that they were not honestly conceived by the Greeks to be concerned with justice. For the Greeks, one's place in society was simply given, and the only question raised by justice was not whether that place was justly assigned, but whether it was suitably recognized, so that everyone got what was due them, given their performance of their assigned roles. It was overreaching oneself, stepping out of one's place, failing to recognize another's due, that constituted injustice.

¹¹¹As for the gods, in Homer they are as subject to pressure from other gods as men are to pressure from other men, and even Zeus, stronger than all the other gods together, is often forced to adapt to the wishes of his wife and his relatives. So the balancing of opposites leading to equilibrium works even here, in a relatively chaotic environment with beings so powerful as to be immune to any hostility from most of the world around them. Anaximander's introduction of "law" into the world is not an introduction of Newtonian law, or anything like it. Rather, law emerges from the disorder dominated by the conflict of opposites.

12. PRE-PHILOSOPHICAL ETHICS IN GREECE

Shame should not be described as an excellence... the sense of disgrace is not even characteristic of a good man, since it is consequent on bad actions... To be so constituted as to feel disgraced if one does such an action, and for this reason to think oneself good, is absurd... Continence too is not a virtue, but a mixed sort of state...

Aristotle, *Nicomachean Ethics* IV 9.

The *Iliad* and *Odyssey* provide our earliest glimpse how the Greeks saw personal excellence, or “virtue,” as “*arete*” is usually translated. They make it clear that the 9th century feudal culture they reflect valued most highly those traits that led to success in war.¹¹² Why so?

One regards as excellence of character those traits that make people effective in their societal roles. What counts as excellence in a warrior, a wife, a child, a day laborer, or slave, will be different in each case, since these very different roles require very different personality traits to be carried off successfully. In a child one might seek obedience and respect, in a wife, modesty and good counsel, but in neither of these would one look for the commanding presence essential to a war leader. Some questioned if there is any such thing as excellence without qualification, unattached to a specific role, and some tried to identify such excellence with traits that would be useful no matter what position one was in. But equally often virtue without qualification was identified with those virtues appropriate to the societal role carrying the greatest prestige and power over others, and the greatest security from others’ hostility. Somehow, any virtue associated with a lesser role seems a lesser virtue. The child’s virtues are not as great as those of a man, and a tradesman’s not as great as those of a statesman. In Homeric Greece the favored role was that of the aristocratic warrior, and later it was that of the citizen, in both cases the male whose voice counted in community decisions because of his military worth. The powerful and respected are ever those who can cause trouble if they are crossed, and in the Ancient world it was the trained warrior who could cause trouble.

Moreover, the greatest catastrophes that could happen to a Greek city-state were the disasters that came from warfare, and Greeks were almost always at war, so the warrior who defended it against the disasters of war could easily be viewed as the most important man in the community—he deserved his honored place,

¹¹²For the poets on individual virtue and personal worth, see especially Adkins (1960) and (1971). His conclusions may be somewhat overdrawn, though many critics seem to overreact, and insist on misunderstanding them. For judicious correction, see Lloyd-Jones (1971), A.A. Long (1970), Creed (1976).

and his virtues deserved to be placed first of all. But it is also obvious enough that if honor is not given the warrior, he will take it. Of course, the warrior's own bellicose behavior did much to make the protection of the warrior a necessity, and the good of the community might even be sacrificed to preserve the honor of the hero, even if, in the end, the honor given the hero generally benefitted the whole community.¹¹³

The warrior's worth was ultimately rooted in wealth. Training, like the development of athletic prowess, took time, and resources were required to equip oneself, and time and resources meant wealth. The upper class in Greece always prided itself on not working for a living, and the lowest class among free men were wage earners. At a middle level, one worked within one's own business, as a potter, say, or a farmer, and sold the products of his labor. At the highest, one lived in town, and employed freemen or slaves to do the work, and an overseer to run one's estates. Even in Homer the heroes are all wealthy.

Moreover, though a member of the ruling classes would very likely have a good deal more military skill and valor than a commoner, the worth of a member of the ruling class was measured, in fact, not by his skill in personal combat, but by the number and quality of retainers and friends he could bring into a military enterprise, and perhaps the quality of his counsel. It is true that one could claim excellence on the basis of personal prowess alone, if it was great enough, as Odysseus did when stripped of friends and resources in Phaeacia, but it must be born in mind that Odysseus was destined to reclaim his rightful social position and influence. It was assumed that virtue, and only virtue, would gain friends and allies, so that virtue begot honor, but this disingenuous assumption, of course, functioned chiefly to justify the influence of wealth and inherited position. Virtue could not be taught, it was supposed, and found only in those of good family, and since honor could, in theory, only be gotten and maintained through virtue, one could claim virtue on the evidence of one's connections, influence and inherited wealth alone, even though relatively lacking in counsel or prowess, as did Menelaus, son-in-law of Zeus.

In Homer's time, then, status depended most of all on the number and quality of a person's guest-friends, that is, people who would receive him in their households, who owed him favors and might be counted on to provide support when it was needed. He may not know a guest-friend very well, and many guest-friends might be inherited from his father, or some other relative or friend. He might gain or cement guest-friendships through marriage, or through personal services or cooperative enterprises. Guest friendships are marked by exchanges of gifts. Homer considers a person just to the extent that he honors the recognized

¹¹³For a perceptive brief treatment of the Homeric ethos, see the opening chapter of Irwin (1989).

rights of his guest-friends and treats harmless strangers with the courtesy due to a guest-friend. Zeus is especially concerned to punish those who violate the guest-friend relationship, particularly when the friend is vulnerable and in need of help, or has done one great favor and deserves loyalty. Justice, of course, adds to our effectiveness by cementing guest-friend alliances, and injustice alienates our friends and allies, and in Homer justice has a good deal more to do with relations among guest-friends than the warrior's relation to his underlings in the community.

Nonetheless, person of honor and virtue did recognize obligations to underlings, whether clients or members of their household—not necessarily the obligation to be kind (though kindness is treated by Homer as a sign of strength), but certainly the obligation to defend and protect. A patron who could not protect and aid his own clients lost status, so to insult or harm the client of a powerful patron was to insult the patron himself. A proper aristocrat is always easily insulted, for everything hangs on his reputation, and he cannot allow the word to get abroad that he, or those under his protection, can be attacked with impunity.¹¹⁴ But, of course, such motivation in one's protector may not be very reliable if he has ways of building influence and reputation that involve ignoring the interests of his less wealthy clients in favor of those of his own class.

It has been suggested that Homeric culture regarded failure as something in itself shameful, regardless of one's efforts or motivation, unlike our more reasonable selves, who find nothing shameful in failure that results from no personal fault. For Homeric culture, it is the public shame, the failure there for all to see, that is important, for us, not private personal worth. Homeric man did consider it shameful to fail no matter what the odds, and no matter how good an effort was made, and though the shame might be moderated by a good effort and adverse odds, it could not be entirely removed. Consequently, one's excellence hung not only on personal traits, that is, suitability for the noblest tasks of warfare and rule, but also on luck, whether it be the good luck that converts ability to success, or the luck of birth, with the connections and upbringing suitable to noble tasks. Indeed, good luck was sometimes itself considered a kind of excellence in a man. The effect of luck on personal excellence is a common theme in Greek literature. This effect was often denied in later philosophers, who tended to think of virtue as dependent on something entirely within the individual's control, on his character. But if one sees personal worth as dependent on personal traits that make for effectiveness, including such traits as good birth, wealth, connections, resourcefulness, training, and the like, the traditional Greek view is not so odd. Indeed, even if we think of personal excellence as restricted to character traits that

¹¹⁴Among the lower classes, of course, this is not a virtue, for those who are easily insulted take on a great deal of conflict that they can't easily handle, and are generally regarded as trouble-makers.

make one effective, the Greeks observed that character depends on upbringing, which depends on one's birth. It may well depend as well on the circumstances one faces. Many are virtuous only because they never faced serious enough temptation, or never suffered a disaster that took all meaning from their lives and rendered noble behavior pointless to them. Perhaps we should all do despicable acts if we were unlucky enough to be put in the worst situations.¹¹⁵ One must be lucky to be virtuous.

It would be hypocritical for us to insist on finding this view of things entirely alien. We do attach some importance to merely moral virtues, which are conceived to be inalterable by external circumstance and dependent on our wills alone, but this is largely a matter of theory. In practice we find ourselves judging others, whenever their functions are of some importance, on the basis of their effectiveness rather than their intentions. A wife or father-in-law will come to despise the honorable, well-intentioned, but incompetent husband soon enough, and only a neighbor, someone who does not have to depend on the man, will likely come to his defense. One who cannot provide for his family is worthless as far as those who are concerned for his family can see, and it does not matter if he is also a saint. Of course, habitual incompetence often masks bad intentions, and some of the bad reputation of the incompetent rests on this point. There is also a distinction to be drawn between the incompetent, and the competent but unlucky. We respect the latter more, in part because we expect luck will turn sooner or later, and we expect the competent to take advantage of the shift in fortune when it does. But taken all in all, almost no one is very tolerant or respectful of those who cannot do their jobs, whatever the reason, and we all find that our self-respect hangs not only on our awareness of proper intentions, but also on our awareness of actual competence and success.

Still, it might be objected that Homeric heroes don't seem to feel guilt, so that even if they react as we do to failure in general, they do not react as we do to the failure to be just. They feel pity for others, shame, regret, of course, but nothing, one might say, emotionally commensurate with a violation of the moral law. It is not a matter of failing to have internal standards, for they do have them, and they honor men who set high standards for themselves, since that is appropriate for a person of excellence. Perhaps they do not see moral standards as possessing external validity? But what of the standards of religion and justice, specifying that they dispose honorably of their dead, that they not betray their friends, and so on? Homer clearly thinks such standards are legitimately applied to all men's behavior, and imposed on us by the gods. Why, then, do we see

¹¹⁵For the dependence of character on upbringing, age, and circumstance, there is Aristotle's famous discussion in the *Nicomachean Ethics* (see Nussbaum (1986) 336 ff.). For the effects of disaster on the fundamental faith in moral norms that preserves one's excellence of character, see Nussbaum (1986) on Euripides's *Hecuba*, in which Hecuba, the Trojan Queen and a woman of highest character, is finally reduced to taking a terrible and unjust vengeance by the murder of her last remaining son.

no portrayals of the internal struggle with guilt in Homer? But what is a struggle with a sense of guilt? What we expect, perhaps, is that someone should feel, upon becoming aware of an injustice he has committed, not merely regret, but a sense of personal worthlessness, as though he should never have lived. It is true that Homer's heroes never have that reaction to their misdeeds, or, for that matter, to their failures, and they would not respect someone who did. A person of manly virtue knows his worth, and the poets had no interest in people who despise themselves. No doubt they knew of such guilt-ridden people, and we might encounter them in comedy, but they did not consider them the models of virtue that Christianity has taught us they are, but rather low types, and they saw no point in making them, or other low types, the heroes of their epics. They thought of shame and guilt as debilitating emotions which a person of real worth would not experience, like David Hume, who remarks that, contrary to the opinion of the medieval Scholastics, humility, or a sense of shame, is no virtue. Aristotle will allow at best that shame is something to which a virtuous person is subject when he falls short, and which may help lead one to virtue, but does not allow that shame or the tendency to feel shame when one misbehaves is itself a virtue.¹¹⁶

Despite its espousal by the Delphic Apollo and the new science, self-restraint, like a sense of shame, seemed only a doubtful virtue to Homeric man. Feudal times, with their warfare of all against all, their shifting alliances and frequent reversals of fortune, might convince people that the most effective and worthy are the prudent, who know their limitations, but they also provide an argument to the opposite conclusion, for the most effective and worthy person is, of course, precisely that person who has the least need to look to his limitations. Self-restraint is a virtue, it would seem, only in those who are lacking in other, more primary virtues. It is a virtue of necessity, appropriate to those who cannot attain full effectiveness. That is why it is proposed as a common view in Plato's *Republic* II that the most excellent of persons would be a tyrant who had such power that he need not restrain himself at all in any area of life, and why Thrasymachus in *Republic* I proposed that self-restraint and justice were no virtues, but only indications of hesitancy and weakness. But Homer recognized that self-restraint was appropriate to all human beings, who, unlike the gods, always fall short of perfection in power and excellence, and so are the playthings of fortune, and it is a Delphic

¹¹⁶Aristotle, *Nicomachean Ethics* IV 9, remarks that shame is becoming to youth, since young men are subject to passion, and make many errors, and shame will correct their behavior, but it is not becoming to age, for an older man should no longer be making errors. Nor, he points out, will shame in fact occur in a good man, since he will do nothing to be ashamed of. He even adds that it is absurd to think that the disposition to feel shame when one acts badly is a virtue, though it helps form one to virtue, and so is a good thing in those whose errors can be corrected thus. Aristotle never speaks of guilt, only of shame and, in other places, a sense of responsibility.

commonplace that those who lose track of this point court disaster.

The main plot of the *Odyssey* concerns Odysseus's loss of self-restraint and justice in the course of the fighting at Troy. This leads him to an act of piracy against the Cicones which is punished by a storm from Zeus that drives his ships from their course. Further piratical attempts entangle him with the cyclops Polyphemus, who calls down a curse from Poseidon, god of the sea, when Odysseus pridefully, and foolishly, reveals his name in a boast of victory over the one-eyed giant. Even after he has relearned justice and self-restraint, his dependence on his crew, who do not learn their lesson so readily, creates yet more trouble for Odysseus. He is finally cast up on the island of the Phaeaceans, naked and without ship or men, to find his way home once more to Ithaca, but only when he has fully recognized his vulnerability and dependence on others, and learned genuinely to mourn the deaths of the heroes at Troy, both Trojan and Greek. And not only Odysseus suffers for his overweening sense of his own prowess. In the *Iliad* Achilles, the most powerful warrior in the Greek army, overreaches himself when he refuses to make up a quarrel with Agamemnon after that leader offers amends for the insult he has inflicted on the Hero. Unlike Odysseus, Achilles is invulnerable to direct damage, but he suffers even so, because of his attachment to his friend, Patroclus, who is killed by the Trojan Hero, Hector. Achilles's anger now exceeds all bounds and he kills Hector, mutilates his body, and refuses it burial. In the climactic scene of the epic Priam, the father of Hector, comes to Achilles's tent to beg for the body of his son. Achilles, reminded of his own father, finally forgets his anger and recognizes the perilous contingency of human life. Even the invincible warrior is vulnerable, for he must have friends to lead a good life, and he cannot always protect his friends.

Even with the endorsement of Homer, self-restraint remained as much a sign of the weakness that demands it as it was of the strength it gives, even if that weakness is universal among men. The gods, surely, would not need self-restraint. But as city-states established themselves, the absolute necessity of self-restraint became more evident, for as the state as a whole came to be more important than the powerful families that at one time dominated, one's dependence on fellow citizens in endeavors of war became perfectly evident even to the most foolish. No longer did individual prowess count for anything at all in battle, but only disciplined fighting in massed formations. Hence self-restraint in one's actions toward those outside the family was no longer a sign of significant weakness, for no one could imagine a person so strong as to have no need to be respectful of his fellow citizens. Indeed, as the individual, even the leader of an important family, ceased to be able to wage war without the backing of the whole state, the ideal of the self-sufficient, invulnerable and ever successful hero, by which some in Homer's time were seriously tempted, became nothing more than nostalgic

fantasy. Only states, and their heads, could now take such an ideal at all seriously.

As the great change came over Greek politics in the 8th and 7th centuries poets were enlisted by the state to urge on the citizens the new communitarian ideal, praising the cooperative and steadfast worthiness of the heavy armed infantryman, who holds his place in the ranks with his fellow citizens, obeying orders and giving way neither to fear nor the urge for independent action. Most notable is the poetry of Tyrtaeos (about 640 BCE), an Athenian who immigrated to Sparta, and whose fire-breathing patriotic lines extol the steadfast heavy-armed spearman who falls in battle as the noblest of men, one who will be mourned universally ever after by his fellow citizens. He is mocked by the more urbane Plato as rather absurdly enthusiastic, and Archilocus, who wrote somewhat before Tyrtaeos, has his own fun outraging such heavy-handed patriotism, denying that any soldier will be honored long after the fighting stops, and professing himself proud to have had the good sense, when the battle went sour, to abandon his shield and spear and take to his heels. But however men reacted to it, henceforth a new ideal of the virtue of the citizen was abroad, one at odds with the Homeric conception of the independent and valorous head of the homestead, as well as the more realistic ideal of the loyal and effective member of the clan.

13. THE PROBLEM OF EVIL IN GREEK MYTH

Before this time men lived upon the earth
 Apart from sorrow and from painful work,
 Free from disease, which brings the Death-gods in.

Hesiod, *Works and Days* 90-92¹¹⁷

Given that Zeus is just, can we explain why people suffer the evils they do? Suffering is the lot of man, as Zeus himself admits in the *Odyssey*, when he says, “all their afflictions come from us, we hear. And what of their own failings? Greed and folly double the suffering in the lot of man.”¹¹⁸ If greed and folly double our allotted suffering, then half our sufferings are our just lot, even when we are on our best behavior. Why is this our lot? Is it merely that it is appropriate to mortals to suffer, as it is appropriate to peasants not to have much money? Or is the justice of our lot rooted rather in some crime that deserves punishment?

A story explaining this matter, derived ultimately from Mesopotamia, is related in Hesiod, and later

¹¹⁷Translated Dorothea Wender, *and Theognis*, Penguin Classics, 1973.

¹¹⁸*Odyssey* I 32.

in Aeschylus.¹¹⁹ Human beings have a hard time in life, fundamentally, because they have stepped outside the proper bounds of mortal animals, taking something divine into themselves, so that the Gods find it necessary and just to restrict and limit their power to what is suitable for mortals. In the Greek story, human beings had been made by Epimetheus and Prometheus, craftsman gods of the elder generation of Chronos, whom Zeus overcame. Prometheus had seen the drift of things early on, and thrown his support to Zeus, but when arrangements were being made concerning the sacrifices under the new rulers, Prometheus, perhaps smarting at living under the upstart, or in a misconceived effort to get too much for his cherished human beings, deceived Zeus into accepting the worse portion of the beast, the fat and bones, leaving the rest to men. Zeus took revenge, as was his just prerogative, by withdrawing fire from men so that they could not perform the sacrifices (like Wagner's Wotan, he cannot go back on his word). This left them helpless and likely to perish. Prometheus felt responsible and stole fire from Olympus, that is, he provided men with technological intelligence and the stuff of Zeus's thunderbolt. He gave it to men, along with all the other arts and crafts, so that they could live. This was enough to set them permanently at odds with Zeus, for their very existence depended on the unjust possession of stolen goods.¹²⁰ Zeus, perhaps repenting the contemplated destruction of human beings, did not take his fire back, but contented himself with retaliation against Prometheus himself, and insurance that human beings should live difficult lives through the introduction of Pandora, the first woman, on the scene.¹²¹ Pandora was a civilizing influence, who was taught the arts suitable to a woman by Athena herself, the Goddess of Wisdom, but she is also the source of many evils (a feature that the misogynous focuses on), including, above all, the necessity of hard work if one is to live.¹²² The deepest themes of the story can be traced back to the *Epic of Gilgamesh* and Sumerian mythology, that is, as far back as the written record in Mesopotamia will take us. As far back as that, we find the notion that human beings somehow have sinned

¹¹⁹Hesiod, *Works and Days* 42–105 and *Theogony* 596–619; Aeschylus, *Prometheus Bound*.

¹²⁰

¹²¹This may also be connected with the limitation of men to a short life, that is, a provision for the continuation of the race through sexual reproduction. Compare *Genesis* and the introduction of death in connection with the actions of Eve, whom Yahweh provides as a companion to Adam, and also the withholding of the plant of immortality from Gilgamesh when he proves himself unworthy of it.

¹²²Again, this is a Mesopotamian theme, echoed in *Genesis*, which has it that, after being driven from the garden, Adam will have to live by the sweat of his brow. In the *Gilgamesh* epic the introduction of a woman tames a wild man of great power, but also estranges him from the natural world, so that he must henceforth live in a city, the animals that once were his companions now fleeing from him. When one ceases to be a hunter and becomes an agriculturalist, one henceforth lives with women and women's arts, for which there are compensations (sexual affection, children, care in one's old age, maintenance of the ancestor cult after one's death), but also something to pay (awareness of death and evil, hard labor and loss of freedom).

against the order of things in the development of their technology and their self-awareness, specifically the knowledge of good and evil and the knowledge of death. Not to put too fine a point on it, they had sinned in becoming rational. We see here the origins of the notion in Anaximander that existence itself somehow involves an injustice for which we must pay.

The exact character of that injustice becomes clearer in other parts of the Greek tradition. In the *Odyssey* Odysseus, whose very name means “trouble,” finds himself in a paradise when he is in the land of the lotus eaters, and later with the nymph Calypso and in Phaeacia. In each case, he can think of nothing except getting home. In Phaeacia there is no war and great plenty, and the land is favored by Poseidon, who seems to represent nature itself. But Odysseus stands out from the men there in his athletic abilities and his wiliness, the Phaeacians excelling rather in dance. The point seems clear. Paradise gives no scope for activity of body and mind, and can only be inhabited by a weak race. It is a point the historian Herodotus also makes—soft countries breed soft men. Eating of the lotus causes Odysseus’s men to lose all memory of home and all desire to accomplish anything of worth. Calypso, though her charms are great, can offer Odysseus nothing in the way of a challenge to whet his abilities on, and he lives with her in complete idleness. Odysseus first made trouble for himself by offending Poseidon, that is, Nature, and other men, as we have seen. Menelaus, a merchant and not a man of personal prowess, will settle in the Isles of the Blessed, but that he can do so and be at peace only points up his inferiority to Odysseus as a man.

The point seems straightforward, and it fills out Anaximander’s vision. The evils of our lives are necessary if our lives are to be worthwhile, for if we are to accomplish deeds worth accomplishing we must face opposition, and we must be unjust. We are trouble for others if we are able, and if we exercise our abilities in worthwhile competition, others will make trouble for us. Above all, we will not leave nature well enough alone, and she will also be our foe. It would be more peaceful not to recognize any ideals of performance or accomplishment, and so settle for what nature provides us, free of the “knowledge of good and evil,” but it would not be *better*. Better is to make trouble for others and ourselves, striving to live a life in which we accomplish something worth telling about. A good life is a life in opposition, in pursuit of an

impossible ideal.¹²³

14. HERACLITUS

Concerning things unseen [by mortals] and things mortal the gods see clearly,
but so far as men may conjecture...

Alcmaeon, Fragment 1.

The human is not disposed to possess true judgment, but the divine is.

Heraclitus, Fragment 78.

Of the Logos, which is as I describe it, men always prove to be uncomprehending, both before they have heard it and when once they have heard it. For although all things happen according to this logos men are like people of no experience, even when they experience such words and deeds as I explain, when I distinguish each thing according to its constitution and declare how it is; but the rest of men fail to notice what they do after they wake up just as they forget what they do when asleep.

Listening not to me but to the Logos it is wise to agree that all things are one.

Heraclitus, Fragments 1 and 50.¹²⁴

Science did not replace myth in Greece as the ideology of the educated because scientists had proof that they had the correct view, while myth did not. They had no proof that the gods of the myths were unreal, and their own views were wildly speculative, as any clearheaded person could see. A few points in astronomy were reasonably secure, and eventually, as new views struggled with old for dominance within the scientific tradition, the continuous search for evidence and arguments would provide scientific naturalism with secure views, or what was clearly a road to them, on pretty much every major question that might be raised by a

¹²³Or so Odysseus and Homer would say. A farmer trying to make a living might have disagreed, and have seen here simply a just punishment for men's stepping out of their place in the order of things. He would have known how a punishment often sets up a permanent opposition between punished and punished, no matter how just the punishment may be. Punishment in the Greek mind did not necessarily entail reconciliation, any more than it does for Augustine.

¹²⁴Translation from Kirk, Raven and Schofield (1983). The opening to Heraclitus's book is intentionally ironic, mocking traditional books of wisdom that promise to inform the ignorant and improve the wise. His wisdom, which is *real* wisdom, will do neither, for men are too foolish to understand it.

layman, but that lay very far off in the future. No doubt, scientists prided themselves on their rejection of ancient superstition, but they did not prevail with the thoughtful because of superior evidence for their views, but because they had come to an appealing, and fundamentally naturalistic, picture of the nature of and justification for governmental and social power, and it was assumed the world was organized on the same principles as human society.

But this sort of reason, however it might seem unspoken wisdom among the enlightened, could not convert the conservative adherent of the old world view. To people who took it that one could know things only through actual experience of them, or else through testimony from others who had had such experience,¹²⁵ and that otherwise one could only conjecture, the theories of the new science must have looked wildly implausible. But the Milesians did not advance their views, at least their core views about the natural laws underlying the operation of the universe, as mere guesses. They wanted to claim knowledge, for the justification of the new political system rested on their theories.

Perhaps at first they were philosophically innocent, confident without reason in their new and captivating perspective, though the second generation of thinkers, at least, Xenophanes, Alcmaeon, and no doubt others, recognized that their theories could not be established with certainty, even if they were recommended by their explanatory power. Whether doubts arose in their own camp or were pressed by their enemies, soon enough the need to establish that their confidence was not irrational came home to these early scientists. Perhaps Anaximenes had already worked out the line that was to be taken on the issue, though we have no solid evidence for this. The first person we can be sure had an explicit, if only nascent, philosophy of science was Heraclitus.

Heraclitus (active before 450 BCE)¹²⁶ was a native of Ephesus, a town about twenty-five miles up the coast from Miletus, and second only to Miletus in commercial importance. He stemmed from an ancient family, and got on bad terms with his fellow citizens over some political dispute. Little more is known of his life. Most of the stories told of him are transparent and rather vicious inventions of hostile writers extrapolating

¹²⁵Homer, *Iliad* II 484-7 suggests that the Muses know everything because they were present, whereas men rely on their inspiration to report the truth in their poems.

¹²⁶For Heraclitus, see Wilcox (1994), Schofield (1991), Hussey (1982), Kahn (1980), Kirk (1954), Vlastos (1955a) and Wheelwright (1959). We know of his thought chiefly through more than a hundred brief, quotable fragments preserved in later writers, and some intelligent assessments in Plato's dialogues. His book seemed to Theophrastus to be only half finished, which he attributed to Heraclitus's depression, so we probably have a pretty good impression of it from existing fragments. The style of Heraclitus is distinctive, especially in its pregnant ambiguity, and its poetic skill enables us to distinguish genuine fragments from forgery pretty readily.

from the existing fragments of his work.

Heraclitus speaks in a number of places of the *logos*, an underlying cosmic principle, a “measure” or “proportion” in things that is somehow the source both of intelligence in human beings, and of order in the world. To possess the *logos* is to have a certain insight into the workings of the world. This insight is natural to human beings, though it is divine in origin, for human beings have souls made up of the same intelligent stuff of which the world is composed, namely fire (which takes the place of Anaximenes’s air). The intelligent insight of the world soul into its own operation is thus transferred, under favorable conditions, to the fragments of the world soul that enter into men and make them intelligent beings.¹²⁷ Favorable conditions here include a kind of alertness or attention, for the fire of our soul is cooled and moistened in sleep, and by strong drink, so that we become less aware both of ourselves and everything else.¹²⁸ They also include contact with the outer fire of the world, the world soul, which is needed to nourish our private soul and keep it from going out. This contact is gained through the senses, especially, we might suppose, sight. One who sleeps and dreams enters a private world of illusion, but the waking open their eyes, and enter the real world, which is not private, but common to all.

For Heraclitus, then, failure to recognize the truth occurs due to obtuse inattention, leading to a failure to recognize the *logos*, the underlying causal principle of nature. He remarks that people often fail to recognize the obvious, and once they do notice something or see the solution to a problem, they will regard it as obvious after that, and wonder how they could have missed it. What happens, perhaps, is that one hits on an interpretive principles that makes sense of everything, including new facts as they come up, when it hadn’t made much sense before. This alters how things look. One *sees* the principle working in the world now, and wonders that one had not seen it before. Knowledge of the *logos* is like that. Knowledge involves the senses, attention, and understanding the interpretive principle, so that one sees what is going on, and is no longer like a barbarian listening to a discussion in Greek, a language he does not understand. Heraclitus does not possess the distinction between necessary and contingent truths, nor does he see any necessity to give different accounts how these two are known. Indeed, he pays little attention to mathematics at all. There is no distinction here

¹²⁷I am making a connection here between speech and reason, assertion and understanding, which seems implicit in the multifold use of the Greek word *Logos*. It is part of Heraclitus’s picture of the world that it is always asserting its order and its ruling principle, setting it out for us to understand, as it were, if only we have ears to hear.

¹²⁸Fragment 117. Schofield (1991) 20 suggests that drunkenness, in which the soul seems to be weakened by becoming moist, may have been the crucial clue leading to the hypothesis that soul is fire.

between reason, leading to knowledge of mathematics and necessary truths in general through argument and the perception of necessity, and knowledge gained through observation or the senses.

Just as the *logos* is divine, there is a divine law (*nomos*, perhaps ‘custom’ or ‘norm’) that nourishes human laws, and governs even “the sleepers among men” (even those who do not recognize it), and this is common to all, and known through the *logos*. Knowledge of this law enables men to live well together, crafting the constitution of their state in such a way that harmony prevails.

However, harmony is produced only through strife, despite (or rather, through) the fact that, as the *logos* tells us, all things, in particular all opposed things, are one. In what way? Some of Heraclitus’s remarks tell us that awareness of one opposite is necessary if we are to know the other, presumably because it is what it is only by contrast. So, “it is by disease that health is pleasant.” Again, what appears bad to one creature may appear good to another, “donkeys would prefer straw to gold,” or it may appear good to the same creature in other circumstances, “doctors cut, burn and torture the sick, and then demand a fee.” A shift in our viewpoint on a thing may lead to opposite names for it, “the way up and down are the same,” and apparently absolute terms may in fact be relative, “the most handsome man is an ape compared to a god.” In another vein, things are said to be one because they are necessarily parts of a single, larger whole. This is especially applied to opposites that change into one another, for instance, day and night, and life and death. The general point is made clear when Heraclitus says that “the concordant is discordant, for out of all the many particulars comes oneness, and out of oneness many particulars.” Things are what they are, not through intrinsic and independent characteristics, but through their connections with other things, especially their oppositions to other things and their connections to perceivers, who react to them sometimes in one way and sometimes in the opposite way.

Metaphysically, his point is that everything, to be what it is, needs its opposite, its opponent in the struggle between opposites that is the world. Perhaps an even stronger doctrine could be attributed to him, that whatever characteristics a thing has, it also has the opposed characteristics. At least, that would seem to emerge from a generalization of his many specific examples of things that possess opposed properties simultaneously. This need not mean that Heraclitus intended to contradict himself, or that he did not know that that might be a bad procedure, since Aristotle had not developed logic yet. Rather, he saw clearly enough, one must suppose, that things have opposed qualities *in different respects*. But, to have a quality at all is only to have it *in some respect*, and is perfectly consistent with having the opposed quality (which is a different quality) *in a different respect*.

Epistemologically, his point would be that we cannot know anything without knowing its opposite,

and how it stands toward its opposite, as well. This means that each thing is in harmony with its opposite, for it needs its opposite to exist at all, even if its relation to its opposite is one of conflict. It is the war between opposites that is the law of nature, and opposites are one precisely because of this war, not because of any mediating principle. In a related rejection of the Anaximander's vision of perfectly realized justice in the Unlimited, we are told that "strife *is* justice." That is, strife is not merely a means of moving toward an unattainable ideal, the perfect justice only to be found outside the strife-ruled world—strife is the perfect realization of justice in itself. Indeed, "This order (*kosmos*) did none of the gods or men produce, but it always was and is and shall be: an everlasting fire, kindling in measures and going out in measures."¹²⁹ So the world had no beginning, and there was no first falling away from some ideal harmony without the presence of strife, nor does he ever mention anything outside the cosmos in which a conflict-free justice might be realized. Perhaps the order of the cosmos was always as it is now because the same fundamental laws and processes have always been in operation behind the phenomena.¹³⁰ He does not trade in ideals that cannot be realized in the observed world. The world's discord is manifest, as is the evil in it, that is, its discord with ourselves, but he insists that wisdom nonetheless takes the world just as it is as something perfect in itself, not as a mere approximation to a higher, lost perfection. This places him in fundamental opposition to most of Greek thought. He certainly opposes those who take ideals as ultimate realities—Anaximander with his unlimited, Xenophanes and his God, the Pythagoreans and their harmonies, Plato and his Forms—and is later regarded as an ally of the pragmatic relativism of the Sophists and the physical reductionism of the Atomists. But he approaches the problem of evil in the world and our reconciliation with it in a way that has no interest for Sophists or Atomists, who seem wrapped up in local, worldly concerns, and take no notice of such global problems as the existence of evil. Paradoxically, his vision of reconciliation in the realization that all things are one survived chiefly in the Platonic tradition.

One does not arrive at knowledge of all this, according to Heraclitus, by guessing at hidden structures and processes which are then used to explain specific observable facts. He does not argue that his views must be so because of their explanatory power. Rather he suggests that what is needed is to see what is obvious to all if they only look—the strife is there to see, but we don't notice it. His technique is to point out the hidden meaning in the obvious. We recognize the truth immediately if it is pointed out to us in the right way, for it

¹²⁹Fragment 30. Translation from Kirk, Raven and Schofield (1983), modified in view of Finkelberg (1998) 116-117.

¹³⁰That does not follow, of course, but it certainly might seem to. The argument, or something like it, is attributed to Heraclitus in Irwin (1989) 24.

is right in front of us the whole time.¹³¹

This compresence of opposites was later taken quite strictly by some interpreters, who saw Heraclitus as a counter-weight to the Pythagoreans and Parmenides, who, as we shall see, thought that a reality must be what it is, a definite, definable, thing, and not in any way the opposite of what it is. Indeed, they thought the possession of contradictory properties to be a sign that a thing is not real (not an independent substance?), but a matter somehow of mere appearance (of something that appears, whose appearance does not reveal its real nature). Plato uses the compresence of opposites in sensible individuals to argue for the separation of Forms of things, on the ground that the Form is knowable, and so cannot experience the compresence of opposites, as we shall see in Chapter 5. But this is unlikely to be what Heraclitus himself has in mind, for the explanation he imagines how the opposites are present in a single thing only sometimes seems to have something to do with differing appearances.

For instance, he says that “justice is strife,” rather than being (bringing about?) the end of strife. Here the point seems to be one not about differing points of view, but about what justice *is*. The correction that constitutes justice always seems to overreach, says Anaximander. But what if that is not due to the viciousness of the one trying to impose justice, but just because it is not possible to make a correction without the other, who is corrected, feeling aggrieved? Then *all* correction would “overreach” in the sense that it would lead to further strife, and further corrections in the other direction. Justice cannot occur unless it is at the same time an injustice demanding a response, at least if we are speaking here of the justice that lies behind events in the world. The only way to end the feud, in that case, would not be to render justice, but to abstain from rendering justice. One can only stop fighting by stopping, not by winning, or achieving justice. We should not assume that Heraclitus was a pacifist of some kind, particularly since he thinks that if warfare were to cease, the world would come to an end, but it does seem that his point has to do with the fact that both aspects of the process are *essential* to it. Justice is justice *by being* strife. That is not a crazy point to make about a justice that entails some form of retribution or restitution. Every instance of justice is an instance at the same time of taking away what now belongs to a person. Would it be just to return Manhattan to the Indians? Of course it would. But we cannot bear that much strife, so we had better live with the injustice. As another philosopher has remarked, all property is theft. Best, then, to let a lot of thefts stand.

¹³¹See Schofield (1991) for this point. In the case of drunkenness, if Schofield is right, an observed fact *is* explained by a theory about what the soul is—the fiery soul is quenched by strong drink, and so one sinks into unconsciousness. Heraclitus would probably not have thought of it in terms of a proposed explanation, though, but rather have taken it that one can see more or less directly what the soul is by considering the fact in question—it is just a matter of *looking* at it.

This bears on the view often attributed to Heraclitus that continuous warfare leads to continual change, so that nothing stays the same even for the shortest period of time. It is to be doubted that that Heraclitus held such a view. Plato, the chief support for its attribution to Heraclitus, takes it metaphorically in his *Theaetetus*—Heraclitus, he suggests, intended that things have no stable natures in themselves, and are nothing more than what they appear to be, or what they are in relation to other things.¹³² Aristotle and Plato both regard the view as an impossible one, for there must be some stable and unchanging nature to take on different appearances and contrary qualities. If, indeed, something like this view is what Heraclitus had in mind, then he opened up one of the most perplexing questions of philosophy, the question whether there is any knowable absolute reality that is what it is in and of itself, without dependence on any relation to a knower or anything else with which it interacts. While, on the one hand, it seems there must be such a thing, for in the end what we know and interact with must have some nature of its own, on the other hand, it looks impossible to say how we could have any knowledge of what such a thing is in itself, as opposed to what it is *for us*, and it seems impossible to name a characteristic of a thing without relating it to other things. So we might feel compelled to push the reality, the thing as it is in itself, right outside the world we actually experience, or, as Plato seems to have thought Heraclitus intended, we might deny its existence entirely, and place reality entirely in the relative.

This view requires a sophisticated stretch of argument if it is to be established, not merely a new look at the familiar in the light of the Logos, and the argument in question seems to have its home in the time after Parmenides, among such figures as Anaxagoras. Perhaps Heraclitus would have affirmed the less dramatic doctrine that continuous strife means continuous activity, and therefore continuous change, and since the whole world process would come to a halt if the strife stopped even for a moment, it never does stop, nor does the change that accompanies it. Stability will always be a matter of something (some structure?) maintaining itself in the midst of change, in the way a river remains there, even though *in some sense* one cannot step into the same river twice, since it has always changed by the second attempt. Probably what Heraclitus himself said was not that one cannot step into the same river twice, but that “upon those who step into the same rivers, different

¹³²For Plato’s understanding of Heraclitus, see Irwin (1977). Note here that the underlying thing that persists through a change is not denied by Heraclitus. Heraclitus only insists that this thing that is the same is *also* (from another viewpoint) different. What about Fire? Is it always fire? Of course it is, but it is *also* air and water and all the other things that it changes to in the cosmic process. If greater subtlety is sought, the reader should turn to the pages in Chapter 5 on time in Plato’s *Timaeus*, noting that it is *Plato’s* thought that is discussed there, not Heraclitus’s.

and again different waters flow.”¹³³ Here it is clear that the river is a persisting entity, the same, but also always different, for it is composed of ever new waters. Heraclitus’s point seems to be not that there are no persisting entities, but that such entities are always changing, and that their continued existence *depends* on their continued changing. So another case of the compresence of opposites is asserted here, the river is the same and not the same, just as the way up is the way down. Indeed, the nature of things is such that they can *only* persist in being if they continually change, for “even the posset stands, moving,”¹³⁴ and if the water does not flow, we do not have a river any more.

Aristotle remarks that

It has been asserted that everything in the world was subject to generation and nothing was ungenerated, but that after being generated some things remained indestructible while the rest were again destroyed. This had been asserted in the first instance by Hesiod and his followers, but afterwards outside his circle by the earliest natural philosophers. But what these thinkers maintained was that all else has been generated and, as they said, is flowing away, nothing having any solidity, except one single thing which persists as the basis of all these transformations. So we may interpret the statements of Heraclitus of Ephesus and many others.¹³⁵

Hesiod, of course, asserted that the Gods actually were generated (Zeus had a father), though they were subsequently immortal, but did not postulate anything that always was and always will be. The Ionians did postulate such a thing, the *arche*, be it water or air or the unlimited stuff of Anaximander. Heraclitus took this one everlasting thing to be fire. But all else, he said, has been generated. Now this does *not* attribute to Heraclitus the view that all things are always changing, or that nothing remains *in any way* the same for more than a moment, but only the view (which Aristotle says was held by others) that nothing except the *arche* lasts forever. The contrast is drawn in cosmology, with Plato, for instance, who held that the heavens (above the Moon, at least) always were and always will be, unchanging, though in cyclic motion.

If we apply this to a city-state, it suggests that strife may be continuous even though internal peace is maintained. Indeed, the interaction of the citizens, their strife, is what maintains the city-state in being. It is

¹³³Fragment 61. Various other versions of the “river fragment” might have been produced by post-Parmenidean ‘Heracliteans,’ who saw a good deal more metaphysics here than Heraclitus had intended.

¹³⁴Fragment 76. The posset in question is a mixture of barley, grated cheese and wine. The Greek here is “*o kykeon istatai kinoumenos*,” but only after emendation. The original has *diistatai*, “separates,” and it was customary to add a negative, *me*, to make “the posset separates if it is not stirred.” Mary McCabe (1987) suggested the improved emendation adopted here.

¹³⁵Aristotle, *De Caelo* III 1.

not in the abandonment of strife, but in its proper regulation that peace and stability are found. This is because it is in this regulation, assuring that every victory is balanced by a defeat and every action balanced by another action carrying things the other way, that justice is to be found. Justice is found in the world as a whole, and in those parts of the world where this balance in the strife exists, but not necessarily everywhere. Where it is not found, things fall apart, for an organized pattern such as is found in the river cannot be maintained. As much must flow in as flows out. If the harmony in strife is lost or abandoned in a city, revolution will destroy it.

Just as Heraclitus never looks outside the natural order for its source in some prior perfection of justice, neither does he follow Anaximenes in his assumption of one sort of stuff underlying everything else, which takes on various forms but never suffers destruction. Rather, he held that everything there is could, through suitable transformations, be returned to the same quantity of fire from which it came. From this he drew the conclusion that the universe is ever the same, “This order did none of the gods or men produce, but it always was and is and shall be: an everlasting fire, kindling in measures and going out in measures.”¹³⁶ Probably we should see the world as a fire like the fire in a fireplace, in which not everything is fire, for some parts are fuel, some ashes, some smoke and moisture, but fire drives the process.¹³⁷ It is a dynamic equilibrium in which the overall proportions of the opposites, and the structure of things, remains the same even as things continuously transform one into another. This dynamic equilibrium may seem to take the place of the cyclic dominance of opposites, increasing the Anaximandrian symmetry and balance in the world, but it should be noted that cycles are still allowed, and it is possible that, like the Stoics after him, Heraclitus believed that a periodic conflagration occurred in which all returned to fire. But, if all things can be exchanged for all things, why make the world a fire, rather than, say, a sea or a storm, a mass of water or air? After all, the view is that no one sort of thing persists in the various changes, but in each case something is destroyed, and something else comes to be. It is only the measure, the *logos*, that is constant. Perhaps Heraclitus thought of the world as a fire because he regarded fire as the embodiment of life and activity, the driving substance behind the process, and

¹³⁶Fragment 30. Translation from Kirk, Raven and Schofield (1983), modified in view of Finkelberg (1998) 116-117. A connected view reported in Aristotle is that the fire is finite. It need not be infinite like Anaximander’s Unlimited, for the world does not arise from it, and it need not nourish a world that uses up its material. This view seems to assume that all things *are* fire, rather than being exchanges for fire, but this would be a natural misunderstanding of Heraclitus, assimilating him to Anaximenes, and it is easy enough to see it as asserting that the number of measures of stuff in the world, and so the world itself, is finite, and not part of any larger whole.

¹³⁷This is suggested by Catherine Osborne, in Taylor (1997) 101, who points out that it is misleading to speak of Heraclitean fire as something like energy, as though it were always present through all the changes.

as soul stuff like Anaximenes's air. (When one dies, the warmth of the body departs.) It might have embodied activity because it is mind, which means not only understanding (light), but also will (heat). All that differed from fire, the cold as opposed to the hot, the moist as opposed to the dry, he viewed as less active, less a participant in the world.

The natural order, for Heraclitus, is not the product of god or man, and this means he sees no purpose behind it, and no judge or external standard by which its worth might be measured or to which it might try to conform itself. It simply follows out its own nature. Thus "the everlasting is a child at play, playing a game with himself. The kingdom is a child's."¹³⁸

But that does not mean that there is no ethical import in Heraclitus's account of things. He tells us that those souls that have kept themselves dry become "guardians of the living and the dead," which suggests an after-life for some, at least. But we are also told that "it is death for a soul to become water,"¹³⁹ so at least some souls, for all that Pythagoras may deny it, must die. Perhaps the fate of the soul upon death rests in its virtue, its participation in the life of the world soul, that is, through awareness and understanding, in the life of the universe.¹⁴⁰ To become unconscious, to liquefy, is to die. We have few of the details of Heraclitean eschatology, but that there is one we cannot deny. In one remark he tells us that "to god, all things are beautiful and good and just, but men have supposed some things to be unjust, others just." If we can recognize that we are expressions of the universal fire which lies behind the activity of all those who oppose us, and, indeed, that our being and nature depends on those who are opposed to us and our struggle with them, we become reconciled to the evil we find in the world. Perhaps we could become reconciled in the same way to the evils that arise within society, recognizing how we depend on our political opponents for our being as a citizen. It would not be better for us, Heraclitus says, if everything happened as we wished it to. Above all, we must recognize how we depend on strife for our being, and cease to wish that war might disappear from the world, for it is the source of all unity and every good thing.

¹³⁸Fragment B32. The game in question is something like backgammon. The point seems to be that God can be one, and still oppose himself. It also suggests that there is a fundamental lack of serious purpose behind all this. Hussey (1999) 106–7.

¹³⁹Fragment 36.

¹⁴⁰These views on the afterlife and the soul are no doubt closely related to traditional views. The poet Pindar, for instance, a contemporary of Heraclitus, in his *Dirges* (*thraenoi*), tells us that those from whom Persephone receives atonement for an ancient crime are reborn "in the ninth year," and become noble kings and heroes (fr. 1), and remarks that "the body is subject to the great power of death, but there remains yet alive a shadow of life, for this only is from the gods" (fr. 3). These lines have clear reference to the beliefs of the deceased they praise, reflecting Orphic or similar notions.

Another fragment has it: “Immortals mortals, mortals immortals, living their death and dying their life.” The import of this seems to be that mortals and immortals are the same, and that the death of one is life for the other, which makes sense on the assumption that mortals are individual souls, and the immortal the world soul. The death of the individual is the life of the world soul, since the fire that is cut off from it to make the individual rejoins the world soul. Similarly, the life of the individual is the death of the world soul, cutting fire off from itself. But the individual *is* the world soul, as well, of course, though only a portion of it, and the world soul the individual. It may even be that Heraclitus thought neither could exist without the other, if he took fire only to exist in parcels, large or small. The world soul, it may be, achieves consciousness by being conscious of what is other than itself, and can only do this by being separated off from itself and becoming individual, so that its life is found in its death. Thus the individual would be immortal in the context of a never-ending strife between the individual and the fire from which the individual is formed. It is tempting to attribute the vision of a sort of immortality at the cost of one’s individuality to Heraclitus. The vision certainly appears later in Greek philosophy, and it seems quite possible that Heraclitus is the beginning here. But, of course, this is a great deal to rest on one fragment, and must be regarded as a speculative interpretation, however much it might cohere with the rest of what Heraclitus says.¹⁴¹

If it is the function of religious belief to reconcile us with the world and its evils, showing us our place within the world, then Heraclitus’s thought has its religious side. As part of his program, Heraclitus seems to insist, like the oracle at Delphi, that we must know ourselves and avoid overreaching.¹⁴² Politically, this means we must fight to preserve the laws rather than seeking our own advantage and the dominance of our class at

¹⁴¹For this paragraph, see Schofield (1991), though Schofield, somewhat less adventurously Hegelian, makes the immortal the water and earth which is destroyed when the fire of the soul arises, and suggests that the eschatology of Heraclitus is indeterminate—*something* remarkable may await us, and great men may receive great lots after death, but what it is we do not know. Another fragment has it that the limits of soul cannot be reached, so great is the depth of its *Logos* (here, “nature?”), which may indicate a world soul of indefinite extent, or possibly something else, an intensive depth, as it were, so that when one searches within, as one fragment has it that Heraclitus does, there is no end to one’s investigation. For this, see Wilcox (1994) 91 ff., Snell (1953) 17.

¹⁴²There are a number of fragments dealing with religion which have traditionally been taken to suggest that Heraclitus was critical of traditional religious rites, perhaps allying himself with Delphi against Dionysiac rites and Maenadism. But Catherine Osborne argues convincingly in Taylor (1997) 90–95 that his point in the fragments in question is that actions that are shameful or stupid in an everyday context are in fact honorable and reasonable in religious ritual—so they purify themselves with blood, which is like washing with mud, pray to statues, which is like talking to houses, and do shameful things in the rites of Dionysus. Moreover, they find different rites appropriate for what they confess to be the same god under different names. This is all a straightforward variant on a standard theme, that an action can take on opposite qualities in differing circumstances. Just as the same road goes up and down, so the same act is both shameful and honorable. Perhaps more to the point, purifying oneself with blood is rather like “restoring justice” by taking further violent action in response to violent action against oneself, which, of course, only leads to yet further violence and conflict—but that is precisely nature’s, that is, the divine, way. In favor of the older view of these fragments, they do put their point in the third person, “they” do these things, not “we”, and this suggests distance and criticism, not approval.

every cost. He is an apostle of strife, but strife within the bounds of law.

Heraclitus's picture of the world attempts to justify a certain style of life, to show us our place in the world and point out the manner in which we would best live. It also provides an epistemology, an account how we know this picture to be the correct one. We know the world, and are enabled to interpret our experience of it correctly, because we are made of the same stuff the world is. We are part of the world, and through self understanding, through observing our own will and our desire to overcome, we come to understand the world as well. Self understanding is natural in those who are alert and attentive to themselves. How could we fail, if we are once attentive, to know ourselves? Thus we know the world by looking into our own souls. Once he has defined his approach to the question, Heraclitus presses his opponents hard, pointing out that, if we rely on mere observation, we will find ourselves at a loss to interpret what we see and hear as long as we are ignorant of the underlying laws, the *logos*, behind the observed phenomena. If we do not understand the language people are speaking, the closest observation in the world will not help us to know what is going on in their discussion, and no amount of sensory experience will help the one who does not know the language of nature. Without an innate knowledge of the natures of real things, of the laws that govern the universe, mere observation is helpless. The myths of science are essential to understanding.

Heraclitus mocks the work of the poets, but himself produced a work that is in their tradition. He attacks both Hesiod and Homer as encyclopedists at best, who have no understanding what underlies. His claim is to do the proper work of the poets, but better. Like Homer and Hesiod, he reports the truth and gets it from a divine source, but his divine source is the reason found within a man, which recognizes the truth.¹⁴³ In keeping with the divinity of his source, he presents the truth poetically, even if he does not write in hexameter verse. To take one example, he says that “of the bow (βίος) the name is life (βίος), but the work is death.”¹⁴⁴ Written Greek at his time did not include accents or punctuation, so ‘bow’ and ‘life’ would have looked exactly the same. That means in reading it (one ordinarily read aloud, or listened to a reader), one is forced to decide the ambiguity, but one could decide (somewhat stupidly) that it says “the name of bow is bow, but its work is death,” but also “the name of life is life, but its work is death,” which makes sense of its own. Heraclitus tells us that nature loves to hide itself, and so does his prose, which men may fail to understand even after reading it. Heraclitus is writing in the gnomic style of the mysteries, and he deposited his manuscript in

¹⁴³*Iliad* II 484–93, *Odyssey* VIII 489–91; *Theogony* 26–28. All claim knowledge for the poet, with a divine source, as does Heraclitus, and, in his way, the philosopher-poet Xenophanes, whom Heraclitus also pillories.

the temple of Artemis at Ephesus, perhaps indicating that it was to be taken as a divine revelation.¹⁴⁵ His is the first obscure expression of the Rationalist claim that a divine source for knowledge is found in human reason operating outside the senses. Thus he answers the criticism of the poets—he tells us how he knows what he does, but he goes even further, claiming to do what the poets only *think* they do, to reveal the source and structure of world, and the most important things to be known, wisdom itself, all from a *divine* source.

Heraclitus, though he was philosophically the most brilliant of the Ionian thinkers, seems to have contributed little to the advancement of scientific explanation, and was largely ignored in Ionia, chiefly, perhaps, due to a certain incomprehension. Anaxagoras and Democritus later repeat many of the doctrines of his predecessors, but seem to pick up on none of Heraclitus's innovations. His book seems to have become a byword for obscurity, and the later "Heracliteans" developed their doctrines through a systematic perversion of Heraclitus's writings under the influence, it seems, of the Sophists.

15. ORPHISM AND PERSONAL RELIGION

I am the son of Earth and starry Sky. I am parched
with thirst and dying; so quickly give me cold water
flowing forth from the lake of Memory...

To be spoken by the Orphic initiate after death,
As recorded on the golden plates from Hipponion.¹⁴⁶

With Heraclitus we must take another look at the religious background to early Greek science.¹⁴⁷ First of all, it needs to be pointed out that Heraclitus's rejection of any world outside the natural order would not necessarily have put him at odds with his own religious tradition. The world of the Olympian gods does not really have a supernatural component, that is, there is no part of that world *beyond* nature. The gods in fact personify natural processes and natural forces, so that Athena represents wisdom, Poseidon the sea and wild places, Hephaestus fire and the cleverness of the artisan, and so forth. There is nothing supernatural about them, and in Homer they seem to do their work through the forces they represent. Poseidon is seen in a storm

¹⁴⁵For this paragraph, see Most (1999).

¹⁴⁶Translation from Kirk, Raven and Schofield (1983).

¹⁴⁷For Orphism and kindred movements, see Cornford (1926), Dodds (1951), Guthrie (1952). For traditional Mediterranean notions, see the odd but brilliant work of Onians (1951).

at sea, Athena in a clever idea that springs to mind unbidden. Moreover, beyond an interest in just punishment for those who overreach themselves, there is very little of morality in the Greek gods. So when Heraclitus denies there is any maker or purpose for the world, he only says what is implicit already in Homer.

But setting that aside, we can still ask where Heraclitus got his response to the apparent evils of the world. Much of what he says, of course, would be consistent with the attitude of a Homeric hero, striving to assert himself against the world, to do something worthy of memory, with a clear-eyed recognition how short and chancy human life is. But there is something else at work here that has little to do with Homer. Heraclitus expects, it seems, that a wise person who lives well can reunite his soul to the soul of the universe upon his death, and looks forward to this as a reward for virtue. Whence came *that* idea? Its source seems likely to be some form of religion with the personal salvation of the individual in view, not the religion of the Olympian gods, which centers on the life of the city.

We have noted already that by the 8th century, the temple of Apollo at Delphi, noted for the god's communication with men through the oracular utterance of his priestesses there, had become the place to consult the gods whenever the rituals devoted to them were concerned. The priests of **Delphi** became the *de facto* regulators of Greek civic religion. As such, they found themselves compelled, some time around the 6th century, to answer the challenge of certain wild rites originating in Thrace, adjacent to Ionia on the Greek side of the Hellespont. In these rites the women of a city would dance ecstatically in the wilderness in honor of a god newly introduced into Greece, **Dionysus** (or Bacchus), tearing wild beasts limb from limb and devouring them in their ecstasy. At least this was the reputation of the cult. It may well be a slander brought against it by its enemies. Much less extreme rituals may have taken place in the countryside, and left much to the imagination of the males who were forbidden to attend, and the mythology associated with the cult suggested to the horrified males things that weren't so. Early Christians were accused of devouring babies in their rites by non-Christians, who were not welcome to attend, for they heard stories about consuming the body and blood of Christ, who was identified with the infant Jesus. Had Christianity disappeared without leaving records of its own behind, we might take those stories as truth today, and part of the motivation for the religion's suppression.

In any case, the men disapproved, but these practices were too popular to be stopped, so Delphi organized them instead, appointing specific priestesses to perform them—no longer would all the women in the city be involved—thus converting them to something less revolutionary, one more cult authorized and

regulated by Apollo through his oracle.¹⁴⁸ The Thracian form of the cult expected, through ritual identification with Dionysus, to make its participants immortal in a new life after death, and is almost certainly a form of Shamanism, with its roots in the North, ultimately in Central Asia. Immortality due to identification with a resurrected God is fundamental to the Christian view of things, of course, and it has been suggested by some that this is the source of the Christian view, which did arise among the Greeks who wrote the Gospels (in Greek), as we shall see, and were presumably familiar enough with Dionysian views. It is hard to deny that Christian ideas would have been familiar, at least, to the Greeks, who were generally familiar with the Dionysan cult. But in the beginning, the Greeks, with their Mediterranean world view, had a difficult time accepting that a human soul could have a history before its human birth, or spend the afterlife anywhere except in the underworld, and so they reinterpreted the cult's purpose as the production of ecstasy, an intoxicated state in which the soul has left the body.¹⁴⁹ It has been suggested (by men, one suspects) that the cult centered on women because women, allowed much less freedom than men, at least in polite society, were most in need of the temporary escape from social inhibitions the cult provided.¹⁵⁰

Orphism, a variety of this cult that rejected the violent slaughter of animals, and held on to the expectation of a favorable afterlife for the soul, seems to have entered on the scene in the 6th century BCE. It was, unlike the Thracian cults, a movement involving small numbers of cultivated people in various urban centers, seeking personal salvation. We have a fragment of the founding work of the sect (the document is datable to about 300 BCE), attributed to Orpheus, a musician who supposedly visited the underworld in an attempt to recover his wife, Eurydice, after she died. His music enchanted Hades, the God of the underworld,

¹⁴⁸The dynamics of this cultural negotiation must have been interesting. The Delphic priests had to come up with suggestions regulating the cult that the ladies would accept, in exchange for their ratification of the cult's legitimacy. The cover story, of course, was that the God explained what was to be done in the oracular utterances of the priestess. These oracles tended to be ambiguous in all sorts of ways, which ordinarily avoided their predictions being falsified by events, but here would allow some outright negotiation as the different parties got to work out among themselves what the mysterious words must mean.

¹⁴⁹Or, given how thin our evidence is, perhaps that was the original shape of the thing, and a reinterpretation of the ecstatic frenzy in more "rational" terms as a ritual of identification with the sacrificed God occurred. It is to be noted that the Middle East was not a stranger to gods who die and are resurrected—witness Thammuz and Ishtar in Mesopotamia, Osiris in Egypt, and Persephone in Greece itself. But the god generally was associated with the grain that emerges after burial in the soil every spring, and no association with personal immortality was present.

¹⁵⁰It is well worth the while to read the tragedy of Euripides, *The Bacchae* (405 BCE), in which Pentheus of Thebes opposes the cult at its introduction and is torn from limb to limb in its rites, the women in their ecstasy taking him for an animal. This traditional story is also told at the end of Ovid's *Metamorphoses*, Book III, published in 8 CE. This is a God that *will* be worshiped, or the blasphemous one who refuses will answer to his wrath, though the impiety here lies only in not worshiping Dionysus, not in worshiping other gods besides him.

who permitted him to leave with Eurydice, but only on the condition that he not look upon her until they were once more on the surface. She followed, but he looked back at her too soon and lost her again. He was supposedly torn to pieces by the Thracian women when he stumbled into one of their Bacchic/Dionysan ceremonies, a victim of the Thracian cult, but his severed head continued to sing and give oracles. This looks as if the Orphics were a dissident group reinterpreting the Dionysan myth and unpopular with its more orthodox devotees. The Orphic fragment discovered at Derveni in 1962, contains a theogony beginning with Night and working down to Zeus, who constructs the present world. Plato makes reference to unspeakable crimes, and later sources tell us that mankind arose from the ashes of the Titans, who had torn apart and eaten Dionysus, son of Persephone and Zeus, and been duly incinerated in punishment by Zeus's thunderbolts. Thus we inherit this ancient guilt. A sort of original sin, arising from our Titan nature, must be repudiated and overcome, then, and pacifistic practices and vegetarianism are intended to accomplish this. Some golden tablets apparently associated with the sect have been found in tombs at various locations, from the 5th to the 2nd centuries BCE. They bear inscriptions asserting the deceased to be a son of earth (Persephone) and starry heaven (Zeus), tracing his lineage to Dionysus, and refer to drinking from a lake of memory to gain recollection of his true, divine self. The religion was spread by traveling priests who initiated people for a fee.

The northern, Shamanistic origins of these sects are perhaps revealed in their conception of the *psyche*.¹⁵¹ The *psyche* in Homer is the breath soul responsible for one's life, no more than a fragment of the self, and distinct from the active desiring faculty (the *thymos*) and the soul that knows and understands things (the *noos*). Its only function, aside from imparting life, is to go to the underworld when one dies, where it carries on an impotent, semiconscious existence, the only afterlife any normal man can expect to obtain. Still, the *psyche* is, even in Homer, the locus of personal individuality. It is as if the *psyche* in the underworld, though it contains what is essential to the individual, is no longer provided with the energy necessary for active desire and awareness. But in the course of the 6th century a new view of the *psyche* emerged in Greece, as the entirety of the self even before death, including within it activity and knowledge, not merely the life-principle, and it came to be thought somehow divine, experiencing greater awareness when asleep, and after death, than it has in life. To these rather un-Mediterranean notions about the *psyche* the Orphics added the conviction that we live here on earth as punishment for sins committed in past lives. A life of purification is urged on their adherents, and vegetarianism and a strict refusal to harm others, joined with special ritual means, was held to

¹⁵¹Euripides's play has it that Dionysus was born in Thrace, but rejected by his family, who rejected his mother's story, and did not believe him to be the son of a God, and returned to his home country only after developing a following in the North.

expiate these sins so that one's *psyche* could return after death to the heavenly life from which it had been expelled. There seem to have been many groups of this same general type, and we shall see that among philosophers both the Pythagoreans (and Plato after them) and Empedocles (see Chapter 2 below) held such views.

Such cults of personal salvation outside of and hostile to the formal religious rites of the community at large (animal sacrifice is condemned in them) are to be traced to **Shamanistic practices**. Surviving from the religion of a superseded social organization, they preserve a view of the world from before civilization, which is apolitical for the simple reason that there was no politics in the society in which they arose. Reflecting this chaotic situation, the religion saw salvation in terms of the individual rather than the community, and so beliefs in personal survival, reincarnation, and the like were natural to it. The far more organized, class-structured societies of Mesopotamia and Egypt developed an official priesthood and a civic religion which supposedly decided everything in religious matters, but in fact the old medicine men of the preliterate cultures continued to ply their trade in a more or less disreputable religious underground. Purely personal aspirations toward meaning in life, release from guilt, some antidote to death, all persisted and were often ill served by the civic priests, so the underground priests certainly got enough business to prosper. Not every human need can be met communally.¹⁵²

Shamans among pre-civilized peoples are experts in dealings with the spirits.¹⁵³ To some extent they use magic, but the more powerful spirits are difficult to compel magically, and one usually dealt with them through prayer, austerities, and offerings done where the spirit was known to dwell, in the hope that it would grant what was wanted once one got its attention. Most intercourse with the spirits occurs in crises for our ordinary consciousness, entry into adulthood, marriage, commitment to some great project such as a war or a long journey, serious illness, and so on. In brief, one deals with the spirits when one faces either death, or the question of the meaning of one's life and the legitimacy of one's self-defining roles. The spirits help in several ways. They reassure us that human beings have a place in the world, even if it is not the highest place, and can get attention and assistance from those higher up in the order of things, at least if they are insistent and demonstrate real need. They confirm our attempts to establish a new identity as an adult, mother, or whatever, by authorizing the new identity and recognizing its importance, often providing, as a sign of their approval,

¹⁵²For this paragraph, see Swanson (1960).

¹⁵³For Shamanism see Eliade (1964), and Radin.

some gift to help us on our way. For instance, American Indian youths in some tribes fasted alone for a while in the wilderness upon entrance to manhood, expecting some special aid or insight, or perhaps the bestowal of a new name, from their tutelary spirit in a dream.

Shamans have especially powerful tutelary spirits to which they can go for help, and with which they can intervene for others, rather like a ward healer with connections in the political machine. Special training is needed for the role, and the training is generally therapeutic. Ideal candidates for a shaman's training feel with exceptional force the despair and disorientation to which we are all occasionally prone. Ideally, the training brings about a mental breakdown, followed by a reconstruction of their personality and life, and the acceptance of a mission to use their shamanistic skills to help others. The initiatory experience is generally patterned on death and resurrection, and is often thought to be repeated upon death, so that the shaman enters the spirit world intact, perhaps to become a guide for other shamans later. The shamanistic way is capable of considerable wisdom, and requires seriousness of intent and concentration of mind, though individual shamans, of course, vary considerably in their attainment, and often the thing is faked, since it provides a good way to make a living. Ideally the shamanistic goal is more or less individual salvation, along with a vocation for helping others with emotional and medical problems. Shamanism is a world-wide phenomenon that radiated, originally, from central Asia. It is found among American Indians and Africans alike, and lies behind the Indian and Chinese meditative traditions. In the Ancient Mediterranean these disreputable old medicine men preserved an ancient tradition, and formed a reservoir of philosophical and religious creativity focused on that part of our world view dealing with the individual. Shamans have fallen on hard times in the West ever since Judaism and Christianity made their bid to serve both as a civic religion and a religion of individual salvation, but it is not clear even now that their intransigent individualism has seen an end to its influence on the development of philosophy. Indeed, philosophers remain, even today, rather Shamanistic types, disrespectful of the common world view, pursuing their own salvation with elaborate and idiosyncratic world views calculated to force a reevaluation of all things on more pedestrian individuals. Unlike the civilized orthodox, philosophers have a hard time agreeing with one another on anything, and are proud of it.

To make the connection to Heraclitus, we must note that Shamanism embraces the metaphysics of universal spirits already noted in connection with Egypt. The spiritual presence in human beings, the soul, was supposed to be their breath. The soul was typically thought to be compounded from a number of different powers which dissociated from one another upon death, many of the powers returning to their source in the universal spirits from which they were derived. So, for instance, that part of the soul responsible for individual

life might go to the underworld, but leave behind the part responsible for will or awareness, as was the Greek and Mesopotamian belief. Those who identified strongly with some portion of the soul that reunited upon death with the spirit from which it came might expect an immortality much superior to that of Hades. Some Orphic verses spoke of the soul entering us as we breathe, so that the salvation sought by Orphism is a reunion of the soul with the divine air or fire from which it came. This is precisely Heraclitus's doctrine, if I have read it correctly. It is also to be found in various forms in Plato (Ch. 5), Aristotle (Ch. 6), and the Neoplatonists (Ch. 12). Empedocles and the Pythagoreans, in a closely related view, held that the soul experienced repeated incarnations, and had its ultimate home, from which it was exiled while in the body, in the heavens with the gods. One sees these Pythagorean views expressed especially in Plato's Myths at the end of so many of his Middle Dialogues.

16. PYTHAGORAS

Pythagoras, son of Mnesarchus, practiced enquiry beyond all other men and selecting these made them his own—wisdom, the learning of many things, artful knavery.

Heraclitus, Fragment 129.¹⁵⁴

Pythagoras (570 - 500 BCE?) was a prosperous native of Samos, an island of considerable importance less than forty miles from Miletus, and he no doubt made himself familiar with the thought of the Milesians.¹⁵⁵ He left Samos, perhaps about 532, as a mature man, apparently out of discontent with the populist policies of the ruling tyrant, Polycrates, and spent some years in travel. He believed the soul survived the destruction of

¹⁵⁴Translation from Kirk, Raven and Schofield (1983). It is quite possible that Pythagoras had acquired a reputation in Ionia before he left home, and it is this reputation rather than news from Italy that Heraclitus depends on here.

¹⁵⁵For Pythagoras and Pythagoreanism, see Minar (1942), Morrison (1956) on Pythagoras himself, and Burkert (1972), Kahn (1974) and (2001), and Nussbaum (1979) on the movement. More recently, Huffmann has made the movement his own in numerous articles and books. Raven (1948) argued for Pythagorean "number atomism" from the reports of Aristotle, and Vlastos (1959), for instance, argues against Raven's view. The issue is not whether Pythagoreans saw things as collections of parts, separated from one another by the void, but whether they thought that *indivisibles* underlay the things we experience and formed their proper parts. Our major source for the movement is, perforce, Aristotle, for the doxographic tradition after Aristotle is heavily contaminated by projections of later, Neo-Pythagorean views back into antiquity. Moreover, Plato's successors in the Academy seem to have presented Plato's later theory of the incorporeal monad and indefinite dyad, from which numbers, geometrical figures, and finally the sensible world arose, as a direct development of Pythagorean thought. Aristotle makes it clear that Plato originated these views, and the Pythagoreans did not derive the world from immaterial principles. Why Plato's successors made this move is unclear, but it was followed by Theophrastus, Aristotle's successor, who established much of the tradition in the history of early Greek philosophy, and it became the dominant tradition in Antiquity. The only writings of the Pythagorean sect that survive are some fragments of Philolaus's work, ca. 450 BCE, which support Aristotle's picture of things.

the body, and was reborn, sometimes in animals, and he established a religious/ethical way of life, no doubt intended to obtain a favorable rebirth. Certainly some Pythagorean beliefs have close parallels in Orphism, and perhaps the two religious systems grew up together out of a common Shamanistic background in Thrace, borrowing from one another as they grew.¹⁵⁶

Pythagoras eventually settled in Croton, a town in southern Italy that had become rather demoralized from a recent defeat at the hands of its neighbor, Sybaris. Pythagoras inaugurated a political eating club of aristocratic youth, and with his leadership the town revived, reasserting its dominance in the utter destruction of Sybaris about 510 BCE. This was, to speak plainly, an atrocity, and despite later Pythagorean stories of Crotonian virtue and Sybaritic luxury, it seems apparent that oligarchic oppression was the chief political outcome of Pythagoreanism in Italy. There was an attack on the Pythagorean Society in Croton near the end of Pythagoras's life, and he withdrew to Clazomenae (Metapontum), where he died.

The Pythagorean societies joined special religious practices to their political orientation. Later Pythagoreans enforced all sorts of taboos, among them a rule against new members speaking for the first seven years, a strict communism of property, a proscription against any kind of injustice or violence against any living animal, which entailed vegetarianism, and another against revealing the teachings of the sect, perhaps intended to keep others from drawing on the power to be gained through their cult practices. Pythagoras, as founder of the cult, was regarded as a miracle worker even in his own lifetime, and, among other things, it was claimed that he had been at Croton and Metapontum simultaneously, and that he had a golden thigh.

The power of Croton, and the Pythagorean Societies, established in all the cities where Croton gained power, persisted until about 450, when there was a general revolt against the Societies, and their meeting houses were burned. The Pythagoreans who survived seem to have abandoned politics and split into two groups. Some, like **Hippasus of Metapontum**, identified by Aristotle as holding that fire was the source

¹⁵⁶Cornford (1952), Burkert (1972) 120-65. Kahn (2001) Ch. 2 doubts that the doctrine of transmigration and reunion of the soul with the world-soul came directly from a Shamanistic background in Central Asia, and suggests instead that Pythagoras received the doctrine from India, probably by way of the Persian Empire, perhaps as Greeks and Indians mixed in the New Year festivals at Persepolis. Orphism, he notes, might well have arisen from Pythagoreanism, the Orphic poems that define the movement perhaps being compositions of the Pythagoreans coopted to found another sect. There is an Ancient tradition that Pythagoras learned of transmigration from Pherecydes of Syros, an Orphic author of a prose work presenting a story of the beginnings of things, arising from Zas (Zeus), Chthonie (the Earth), and Chronos (Time). But the tradition may be based entirely on the over-interpretation of a 5th century comment of Ion of Chios preserved in Diogenes Laertius, to the effect that Pherecydes's soul enjoys a pleasant existence if Pythagoras is right about the soul. Ancient historians, desperate to know something of their subjects, would often press the scant references they had much too hard to reconstruct their lives and opinions. See Gomperz (1896) I 85-90 for an entertaining account, and Kirk, Raven and Schofield (1983) for a more technical and up-to-date one.

of things and the stuff of the soul,¹⁵⁷ devoted themselves thereafter to philosophical investigation and a purified religious practice. Tarentum became the new center of this philosophical Pythagoreanism, and the sect progressively shrank until it was absorbed bodily into the Platonic Academy around 375 BCE. The philosophical Pythagoreanism in Plato's time included a nontraditional salvationist religion of the Orphic type, defended in connection with a scientific world view, perhaps regarding the practice of mathematical investigation as part of the way to release from the sinful part of oneself. The early evidence attests to a belief in reincarnation into animal bodies as well as human,¹⁵⁸ and a period of reward and punishment between births, all of which Plato learned from his Pythagorean colleagues.¹⁵⁹ There is also persistent reference to the belief in a world-cycle connected to these rebirths, so that all things return to the same state after some long period of time, perhaps when the positions of the heavenly bodies, including the planets, is repeated, and a soul returns to human birth after dwelling in every sort of animal on land, in the sea and in the air.¹⁶⁰

Another group of Pythagoreans, no doubt a large majority, seems to have scattered abroad and continued the sectarian practices of the societies, following a life similar to that of the adherents of Orphism, and apparently eschewing philosophy. Having lost their political power, the Pythagorean societies became a more or less fanatical salvationist cult. Their vegetarianism isolated Pythagoreans from civic religious practices, since it forbade participation in the sacrifice of animals to the gods. To become a Pythagorean, probably even when the Pythagorean societies were first established, meant to withdraw from the larger community and hew close to a small, cohesive group intolerant of religious practices fundamental to the society in which it was embedded.

The relation between these two groups of Pythagoreans, the *mathematikoi* (those who know), and the

¹⁵⁷*Metaphysics* 984a7; the doxography descended from Theophrastus, DK I 109.5-16. He is also reported, like Heraclitus, to have regarded the cosmos as one, limited, and always in motion. Diogenes Laertius VIII 84 states that he held there "was a fixed time for the change of the cosmos." He did not write anything, Philolaus being the first Pythagorean to produce a book.

¹⁵⁸Which Aristotle finds absurd, since he considers the soul to specify the kind to which an animal belongs. Xenophanes, Fragment 7 (Diogenes Laertius VIII 36), reports that Pythagoras bid someone to stop beating a puppy because he perceived in its voice the voice of friend.

¹⁵⁹Given the frequency with which we depend on Plato and Aristotle for our information concerning earlier thinkers, we will be making frequent reference to them henceforth. For now the reader need only note that they lived in Athens in the 4th century, and that Plato, a student of the ethicist, Socrates, developed an enormously influential version of Pythagorean views, while Aristotle, Plato's pupil, took issue with much of what Plato said, and had a habit of reviewing the history of opinions on any given subject before launching into it himself, making his work invaluable to the historian.

¹⁶⁰Herodotus, *Histories* II 123, who hints that Pythagoras got the idea from the Egyptians, though he must be wrong about that. At least Porphyry, in his *Life of Pythagoras* 19, seems to assume that is Herodotus's intention.

akousmatikoi (the followers of oral teachings), following later accounts, introduced into Greece the idea of a two-tiered religion, with intellectuals who understand the teachings in their true, higher, philosophical or symbolic sense, and everyday adherents who take the teachings at face value in all their superficial crudity, while recognizing the superiority of the intellectuals' view of the thing. It seems likely that the *akousmatikoi* did not actually hold the *mathematikoi* in such honor, but the *mathematikoi* apparently thought they should. The division between the two groups was probably foreshadowed in the Pythagorean societies before 450, and indeed, in the Shamanistic religion which forms the background to the movement. The Shaman's understanding of dreams and omens goes beyond that of the ordinary person, and his understanding of the symbolic import of the myths he recounts and the ceremonies he leads exceed in a like manner that of the uninitiated, who merely look on, uncomprehending. In the Greek "mysteries" there were generally several levels of initiation, with the secret meaning of the ritual being revealed to the higher initiates. In the hands of the later Pythagorean philosophers this higher understanding of the senior initiate becomes the philosophical understanding of the expert, achieved no longer through austerities and trances, but through reason. Such higher understanding remains inaccessible to the ordinary believer, of course, because it still requires a level of devotion to understanding the teachings that most have no resources to pursue. Platonism adopted this convenient way of adapting popular religion to the vision of the intellectual, and it became characteristic of later intellectual approaches to Greek and Roman civic religion.

Did Pythagoras himself advance any philosophical doctrines? The state of the evidence makes it hard to tell. After Aristotle "Pythagoreans" forged a large number of works for the man, and the tales of his life lost all touch with reality, making his philosophy an anticipation of Plato. None of this can be trusted at all, but in the early sources, most especially Aristotle, there is evidence that Pythagoras advanced the theorem that bears his name¹⁶¹ (although none that he actually proved it), or at least exemplified the theorem in a 3-4-5 right triangle, or connected right triangles to Pythagorean triples (triplets of numbers such that the square of the first two equals the square of the third). There is also some evidence that Pythagoras discovered the mathematical basis of musical harmony. Moreover, among the Pythagorean sayings used by the unphilosophical *akousmatikoi*,

¹⁶¹The "Pythagorean Theorem" states that in a right triangle, the sum of the squares of the sides forming the right angle is equal to the square of the hypotenuse, which is the line drawn across that angle, and conversely, though this is not usually stated as part of the theorem, any triangle such that the sums of the squares of two sides equals the square of the other will contain a right angle between those first two sides. So a triangle with sides of length 3, 4, and 5 will contain a right angle, and, of course, $3^2 + 4^2 = 5^2$, i.e. $9 + 16 = 25$, or one can conclude that the hypotenuse of a right triangle with sides of 3 and 4 must be 5. The theorem is central to the development of geometry.

there are references to the one as the wisest of things, and to the *tetraktys* (a group of ten, arranged as $4 + 3 + 2 + 1$, for which see the figure below on [page 95](#)) as somehow fundamental to the world and related to harmony.¹⁶² If Pythagoras did indeed advance the views we shall identify as early Pythagoreanism, he probably had not thought them through. The later mathematical Pythagoreanism Plato builds upon was due to Philolaus, whom we shall discuss in the next chapter.

17. THE “PYTHAGOREANS, AS THEY ARE CALLED”

...the Pythagoreans, as they are called, took up mathematics; they were the first to advance this study, and having been brought up in it they thought its principles were the principles of all things. Since of these principles numbers are by nature the first, and in numbers they thought they saw many resemblances to the things that exist and come into being—more than fire and earth and water...; since, again, they saw that the attributes and the ratios of the attunements were expressible in numbers . . . they supposed the elements of numbers to be the elements of all things, and the whole heaven to be an attunement and a number.

Aristotle, *Metaphysics* I 5, 985b23.

The views of the “Pythagoreans, as they are called” reported by Aristotle are to be referred not to Pythagoras himself, but to the *mathematikoi*, especially Hippasus of Metapontum, identified by some as the rebellious founder of the group, who died at sea because of his impious revelation of certain mathematical discoveries.¹⁶³ These people date from the first half of the 5th century. Aristotle tells us they held all things to be numbers, and the ultimate *archai* of things, that is, the source from which they and their essential qualities arise, to be the same as the *archai* of numbers. Particular properties were identified with particular numbers (not through scientific theory concerning harmony, but rather following traditional correspondences suggested to the mind by the imagination)—for instance, the just was always a four, seven the opportune moment, five marriage (of the even and odd, two and three, which are female and male), two opinion and one knowledge.

¹⁶²These sayings seem to preserve the early traditions of the sect, though those that interest us may be forged, since they appear only in late sources.

¹⁶³These apparently had to do with the dodecahedron, though it is improbable that he had hit upon the construction of this figure, which was discovered, probably, by Theaetetus. In any case, it seems to have been a cult object among the Pythagoreans (there are many carved examples going very far back), and somehow his investigation of it was viewed as impious. A later tradition held that someone, apparently a different person, was also drowned at sea for revealing the existence of irrational magnitudes. Burkert (1972) 459–460.

Any number with four as a factor, say a twelve or two hundred (four threes or four fifties), would be a four, and so just. We should not think of numbers here as abstractions separated from the world of physical objects. The word we translate as “number” from ancient Greek, *arithmos*, generally designated a countable collection, as when we say in English, “a number of union members were present.” The notion of an a number as something abstract (a certain property of sets, say) emerged only with the development of theoretical mathematics, which was not yet. Moreover, the notion that there are numbers other than the positive integers was never accepted in Greek mathematics. It seems the Pythagoreans took physical objects to be constructed from units, the number of the units in them determining what numbers they were.

Aristotle specifies that *because* the Pythagoreans discovered many similarities between number and things, they took the elements of numbers to be the elements of things as well.¹⁶⁴ Perhaps this was rooted at first in such fanciful correspondences as already noted, which were part of the religious lore taught by Pythagoras. But one similarity between numbers and things, the one which came to define Pythagorean thought, was in fact discovered by the Pythagoreans themselves after Pythagoras. It is this, that things can be understood in terms of ratios and proportions, just as numbers can. For this reason they took it that things are numbers, made up of units. Why would they say that things can be understood in terms of ratios and proportions? Well, oddly enough it all came out of a discovery in musical theory. It seems that, through someone’s observation of stringed instruments, and a bit of deliberate experimentation, Hippasus knew that a string under uniform tension would produce different musical tones depending on its length.¹⁶⁵ If its length

¹⁶⁴*Metaphysics* I 5, XIV 3. Zeller (1881) 374 argues this point especially clearly, noting that Aristotle says *both* that numbers are the substance of things, so that they are made up of ones, *and* that things are what they are by imitation of numbers. The notion of abstract numbers, taken as properties of sets, say, is Platonic, in the end, for Plato took the numbers to be one sort of Form, ideal paradigms *separated from* the things that participate in it (or imitate it). Zeller (p. 376) notes that one peculiarity of the Pythagorean standpoint is that the distinction between form and matter is not recognized. If two things share the same form, they must also have similar matter. This does not mean that they took numbers to be material, or, for that matters, bodies to be abstract. They only noted that numbers and bodies are similar in ways that suggest that they have the same underlying structures and the same elements. So they are the same. As Zeller suggests (pp. 411–412), bodies meant to them what presents itself to sense perception, number what is grasped by mathematical thought. Given the applicability of mathematics to bodies, these must be the same thing. The difficulties in the position were not evident to them, for they had never thought such things through as we have. And, of course, we have our own difficulties understanding how it is nature should be intelligible in mathematical terms, given how clear we are that the elements of the natural world are *not* mathematical things of any kind.

¹⁶⁵Surely any maker of fretted stringed instruments would have known this? But the Greek stringed instruments of the time seem to have been restricted to the lyre, in which the strings are not stopped, and tuning depends on the tension placed on the strings rather than their length. The discovery may well have been due to deliberate experimentation, then, though it may have been suggested by wind instruments, in which the length of the stopped column of air establishes the note. Alternatively, maybe the report concerning the length of plucked strings is incorrect, and the earliest experiment then might have been another associated with Hippasus in some sources—he supposedly used discs of equal diameter, and thicknesses varying in the required ratio. This would in fact give the desired results. (Burkert (1972) 377)

is shortened to half, a ratio of 2:1, the tone will rise an octave, the same note, qualitatively to the ear, but high, not low. Ratios of 2:3:4, with the arithmetic mean¹⁶⁶ inserted within the octave ratio, will produce a musical interval a fifth above the lower note, and a fourth below the higher, within the octave, an interval that smooths the harsh sound of the octave, and is the basis for musical harmony.¹⁶⁷ This must have been an astonishing discovery. The hidden cooperation (harmony) between these opposite tones was not provided by the tension and warfare between them, as Heraclitus and the Ionians held, but by mathematical means between opposed, large and small/high and low, numbers. The Pythagoreans decided that all harmony must be this way, and it was not conflict between opposites, but mathematical/musical harmonies, provided by the introduction of a mean, that accounted for cooperation in the natural world. Of course, it was not so easy to extend this insight to an account of the cosmos. The details of the theory were filled in only for the more important properties of the cosmos itself, and the assignment of numbers and ratios to these properties often continued to depend on metaphor. So justice was taken to be four because it is the smallest number with *equal* factors. Moreover, the Greeks never did manage to conceive sensible qualities such as heat or force, on a numerical scale, so the physical analysis that emerged from the Pythagorean mathematical approach was restricted to geometrical quantities, length, area and volume, and time and motion. The expansion of mathematical/physical theory to qualities such as force had to wait for the scientific revolution of the 16th century, aided by certain medieval developments in logic that extended the logic of mathematical measurement to any variable quality one might imagine, including whiteness, strength of conviction, and heat. Physical laws would, even into the modern period, continue to be expressed in terms of ratios and proportions, as a Pythagorean would expect. In any case, if this similarity is to be explained, the most natural move is to assume that things are composed of ones, so that they are related to other things, and their parts are related to one another, precisely as numbers are related to other numbers, and their parts to one another.

The units in a thing were identified in accord with the particular demands of harmony in the case at

¹⁶⁶The arithmetic mean between two numbers is the number midway between them, so that, given A and B, there is an n such that the mean, C, is $A + n$, and B is $C + n$. So clearly the arithmetic mean between 2 and 4 is 3. The arithmetic mean between 100 and 150 would be 125. The idea is that A and B, though different, are such that A stands in the same relation to the mean, C, as C does to B. There are many sorts of mathematical means, depending on the relation we are interested in. So a geometric mean between A and B will be the number C such that $A/C = C/B$, that is, the square root of the product of A and B. There can be several means introduced between two numbers. So between 2 and 4 we might introduce, say, 3 arithmetic means, $2\frac{1}{2}$, 3, and $3\frac{1}{2}$.

¹⁶⁷The theory of proportions was developed by the early Pythagoreans without conceptualizing ratios as fractions or rational numbers. A ratio was a relation between two whole numbers. Two ratios were said to be proportional, $a:b::c:d$, as long as a and b had a common divisor m, and c and d a common divisor n, such that, for some p and q, $a=mp$, $b=mq$, and $c=np$ and $d=nq$. For instance, $2:4::6:12$, for here $m=2$, $n=6$, $p=1$, and $q=2$.

hand, sometimes, perhaps, by seeing how the thing in fact developed or grew, developing parts with harmonic relations. The health, indeed, the very being of a human body depends on preserving the right proportions in the four humors, for instance. So the world began as a one, with the central fire, which breathed in the void, and so became a two,¹⁶⁸ as the space between the central fire and the edge of the world, that is, the sphere of fixed stars, opened up, and eventually a ten, as each of the bodies rotating around the central fire, Earth, Sun and Moon, and the five planets, was defined.¹⁶⁹ A unit would maintain an organic wholeness as parts differentiated further within it, each of its parts being itself a unit at the next lower level, entering into that organic whole. The whole was held together by an outer fire, beyond which was the unlimited which the universe breathed in. The origin of the world assigned to the Pythagoreans is strongly reminiscent of early accounts of embryonic development, and it is not out of the way to take their world as a sort of animal with its different organs. The units were not thought of as indivisible, but they were thought of as natural units, not the product of an arbitrary conceptual division.

The picture seems to be in the background of Philolaus's thought, something on which he built, responding to the Eleatic critique of it. So, although Aristotle refers to the *mathematikoi* of the 5th century as "Pythagoreans, as they are called," taking real Pythagoreans to be the unphilosophical members of the religious sect, it may nonetheless be that the real Pythagoreans held to a doctrine that traced all things back to ones, and further to *the* one from which all things arose. Of course, they may have attributed some religious import to their inarticulate metaphysics, for the more articulate form of the metaphysics in Plato and later thinkers certainly had one. But it is not to be assumed that they identified the One with God or the Good—that is a notion evolved in the Platonic Academy.

¹⁶⁸Xenophanes, who opposed Pythagoreanism, asserted that God, the whole, does *not* breathe, apparently because there is nothing outside God to breathe in. The void defined the central fire, the original one, as one, by providing a limit for it, from the beginning. By breathing in the void it produced an internal articulation into several ones themselves surrounded by and defined by the void as their limit. As Philolaus has it, the one draws in breath, void and time (Aristotle presumably citing him in Fragment 201), though it seems likely that the distinction between breath and void was not made by the early Pythagoreans. Perhaps the breath interacts with the central fire to form air, water, earth and the like. The void would be spatial volume in which these things are found. The reference to time presumably means that change does not occur until the revolution about the central fire begins, the periods of these revolutions marking units of time—at least, that is the way it seems Plato reads it in the *Timaeus*.

¹⁶⁹The movement of the earth about the central fire led the important 16th century astronomer, Copernicus, to claim the Pythagorean system as a predecessor to his own, and, indeed, the apparent diurnal movement of the fixed sphere of the stars, the Sun, Moon, and other planets is due to the daily revolution of the of the earth about the central fire, even if their motions through the Zodiac is due to their own revolutions about the central fire. A 'counter-earth' was proposed to round out the number to ten, this being a planet that was always hidden from us, like the central fire, below our feet. This system was preserved in Philolaus, including the introduction of a counter-earth to guarantee that the universe would be a *tetractys*. It is attributed to the "so-called Pythagoreans" in Aristotle, *On the Heavens* II 13, 293a 18 ff.

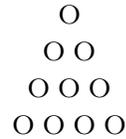
Proportions had been applied by the Greeks before the Pythagorean discoveries to the design of temples, and in sculpture to the analysis of the human figure, and such proportions seem to have been transferred by Anaximander to the structure of the world—indeed, many temples were intended as models of the universe.¹⁷⁰ So it is quite possible that Hippasus was the first to note the presence of proportion in musical intervals, and to talk about the mean producing harmony between opposites, even though Pythagorean thought, borrowing from the craft traditions, had already identified proportions and numbers as fundamental in natural explanation, and associated them with accounts in terms of biological growth. His discovery would have confirmed a traditional view of things, and provided a new insight into how harmonies could bind together opposites in a single world.

With musical harmony as their key to reality, the “so-called Pythagoreans” decided that the presence of a mean between opposites was responsible for their reconciliation, just as the addition of a fourth or fifth within an interval moderates the harsh and hollow feel of the octave. (Strings in a proportion of 2:3:4 will give an octave with a fifth above the lower note, and 3 is the arithmetic mean between 2 and 4.) This theory replaced the Ionian notions of the “hidden” harmony to be found in warfare (as Heraclitus puts it), and Heraclitus and Xenophanes, both heirs of the Ionian tradition, are equally skeptical of Pythagorean thought. One might reflect how the theory could have been applied to politics. Was the key to political life establishing a mean between opposed classes, perhaps in the way that Plato sets up the soldiers as a mean between the rich and the poor in his *Republic*? In a society where citizenship required that one be a soldier, and only soldiers had any guarantee of continued political freedom, it was a plainly anti-democratic move to suggest that not everyone, but only a limited group of experts, aristocrats of technique, should be soldiers. Plato’s anti-democratic insistence that the best should rule the squabbling many through the mean of a professional army is probably characteristic of Pythagoreanism’s alternative tradition to the more democratic Ionian speculation.

In any case, Pythagoreans assigned musical harmony, or proportions later identified as a musical harmony, the function of regulating the world. This is the source of their view that the movements of the heavens produce a musical chord, which is inaudible to us only because the sound of it has always been present, so that we don’t notice it. (The numbers making up the harmony are probably the lengths of the radii of the orbits of the heavenly bodies, but our sources leave this unclear. A quickly moving body, of course, often

¹⁷⁰See especially Hahn (2003).

produces a sound, higher the more quickly it moves.) A cosmological significance was assigned to the *tetractys*, the triangular figure produced by centering rows of one, two, three and four dots one below the other, like so:



Ionian notions may enter into the picture, for while the unit is the fundamental source of all numbers, since every number is both a unit and a collection of units, two and three nonetheless represent the original opposites, for they are the first even and the first odd number. One and two form an octave, as do two and four, but between two and four the arithmetic mean forms an interval of a fifth with the lower note and a fourth with the higher, thus reconciling the two opposites. Hence it may be that the introduction of four completes the harmony of the opposites, and this is why four is viewed as justice.

According to Aristotle, some members of the school derived the one from the limited and the unlimited. The idea was that the limited stuff, or original one, conceived as fire by some, was surrounded by an unlimited void. When the void entered the limited and split it into units the world arose. Apparently every unit is defined by a surrounding void. Some Pythagoreans produced a list of ten oppositions lying behind the functioning of nature. Presumably these oppositions

limited	vs.	unlimited
odd	vs.	even
one	vs.	many
right	vs.	left
male	vs.	female
resting	vs.	moving
straight	vs.	curved
light	vs.	darkness
good	vs.	bad
square	vs.	oblong

explained everything else observed in the world, and the oppositions later in the list somehow derive from the earlier, limit being associated with the odd, the one, the right-handed, male and so on, and unlimited with even, many and so on. It looks as if the limiting void was seen as what imparts order and intelligibility to things, and so the source of goodness and regularity, whereas the material stuff shaped by the void into ones was seen as intrinsically disorderly, in restless motion, and the source of evil. All of this, like the parallels and correspondences we find in Chinese thought revolving around the *Yi Jing*, reflects a literary and symbolic approach to understanding rather than a mathematical or scientific one. They often depend on a correspondence in various realms between the N things (five in the case of the Chinese, seven in the Hippocratic treatise *On Fleshes*, four in the Hippocratic *On the Nature of Man*, and three in Christian speculation).

How did the Pythagoreans think they knew about the mathematical character of reality? Possibly they took the same line as Heraclitus. We *are* numbers. Our souls may presumably be numbers or harmonies (compound, structured numbers) without being the harmony *of the body*, though, looking at Plato's *Timaeus*, it looks as though they would have to be the harmony of *some* body, but it could be an everlasting one, the cosmic fire itself, which is united to our earthy body by a harmony of some kind. Aristotle suggests that some of the Pythagoreans identified motes in the air that are always moving (probably dust particles illumined by the Sun) as soul.¹⁷¹ Plato, in his *Timaeus*, would make it out that the movements of soul are circular and display harmony, but the material doing the moving here is supposed to be much purer than the elements found on the Earth, and the elements of our bodies, so that it is never destroyed. The souls are numbers. That must be why, without reliance on divine testimony or our own senses, we understand the abstract truths of mathematics, such as the Pythagorean theorem, and it explains our insight into the numerical structure of the world as well. But we have no evidence for this doctrine in the Pythagoreans themselves, at least before Philolaus, and it is safer to take it as a natural extension of less definite thoughts by Plato's successor, Xenocrates. In any case, there was no consideration, it appears, of skeptical issues, issues that would underlie the new thought of the Eleatics, which we will address directly. The primitive faith that we are children of the universe, and naturally share in its life and its secrets, was as yet unshaken.

¹⁷¹Aristotle, *On the Soul* I 2, 404a16. For an explicit reference to dust particles dancing in a beam of Sun, along with the correct (!) explanation of the phenomenon, see Lucretius, *On the Nature of Things* II near the beginning.