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1999 Aristotle, Practical Knowledge, and Theoretical Frames

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"In the beginning, God created the heavens and the earth. The earth was without form and void, and darkness was upon the face of the deep; and the Spirit of God was moving over the face of the waters. And God said, 'Let there be light;' and there was light."

I always thrill to a sense of wonder when I read those words. I feel connected profoundly with generation of previous thinkers who wondered at the beauty of this universe and asked how it came to be the way it is. I am reminded that the same generations which saw the final wording of those verses from Genesis were intensely active one throughout the eastern Mediterranean. Thinkers were asking questions about the origins of the universe around them, and finding the older mythological explanations unsatisfactory. A spirit of inquiry was abroad, and brilliant minds struggled to explain the nature of the physical world.

Did the bewildering variety of forms mean that there were many basic building blocks, or could all be reduced to one primary substance? What is "change?" How, for example, can we explain that I remain the same person from birth through puberty and maturity on into old age? I am even "the same" after death in the memory of those who knew me. But I changed physically from infancy to old age. What, then, is the nature of self? What is the nature of the physical world? How can what we perceive be explained?

My focus tonight is Aristotle, and the significance of his approach to knowledge. Some thirty treatises survive today, more or less certainly attributed to him. Six set out the techniques of logical reasoning; there are four major works on the natural world and seven brief essays; then there are the Metaphysics and On the Soul, two versions of a work on ethics together with the Politics, and a work on rhetoric and one on poetics, plus five treatises of biological study and the papyrus fragment on the government of Athens from a collection of constitutions. Most of these works were not published by Aristotle during his lifetime, but came to scholarly attention during the first century BC and were circulated in editions prepared at Rome.

I will review briefly the efforts made by earlier thinkers to understand our world in order to provide context for my discussion of Aristotle's thought. His fundamental assumptions are very different from those of Plato, and I will close by commenting briefly on the significance of those differences.

Book 1 of the Metaphysics provided the starting point for the thoughts I offer tonight. The title –literally "beyond natural studies" – suggests his basic division of knowledge into practical (that is, what can be learned by observing particular examples in the physical world), and theoretical: his creation of a framework relating one set of facts with another. The works which survive today testify both to Aristotle's breadth of knowledge and to his insistence upon organizing it so as to clarify the relationship between different areas of study. He was, in a sense, attempting a "field theory," a theoretical matrix within which all phenomena could be understood.

Here then is Aristotle (my own translations are used throughout). "All humans, by their very nature, reach out for knowledge; the mark of this is our delight in sensory perceptions." "Human beings, both at present and at first, began to love wisdom because of a state of wonder, marveling from the first at things close at hand because of their strangeness, then progressing little by little to investigating greater things, such as the phases of the moon and the course of the sun and stars, and how it all came to be." (Metaphysics 1, 980a and 982b)

"Our delight in sensory perception." Aristotle's approach was based upon careful examination of what our five senses tell us. This data can then be understood within a framework of theory "generated by wonder." This was radically different from what very early thinkers had attempted and considerably different from his fellow Greeks, as well.

Most of our evidence for early explanations comes from the Near East. There, thinkers visualized a creator Being who made things out of existing materials, or used the power of thought expressed through language. The least sophisticated device to explain creation was the genealogic metaphor, with natural elements like Earth and Sky pairing to produce offspring. Even the earliest Greek thinkers used such a mythological explanation, and we find it explicitly set out in the work of the poet Hesiod, who wrote an epic on the birth of the gods. In the 7th century BC when he wrote it, the Assyrians were just being replaced by the Babylonians in the Near East, and Greek adventurers were singing lines from the Iliad and the Odyssey as they explored the Mediterranean. Marseilles and Syracuse and Ephesus are cities which testify to the energy of Greek expansion.

In the various Greek cities which sprang up, intellectual discussion flourished, and those who debated how to understand the world became known as "philosophers," literally, "lovers of wisdom." Four are particularly interesting, all of whom started with "how the world began:" Parmenides, Empedocles, Anaxagoras and Democritus. We have some surviving fragments from each, as well as Aristotle's own comments on their work. The last two are roughly contemporary with Socrates, and the others a bit earlier.

Parmenides spoke of a Way of Truth and a Way of Opinion (or Appearance), and considered all physical phenomena within the Way of Opinion. Ultimate truth, he says, is eternal, unchanging, unmoving, and a perfect sphere. Once this is grasped, there is little else to be said about it, and Parmenides thus turns to the phenomenal world. He postulates Light, a rarified fire which is homogeneous in all directions, and Night, which is heavy and dense. All things are made of both in mixture. The universe is evidently arranged in rings of alternating Light and Night, with a goddess who remains unnamed in the fragments guiding and creating by a system of mating. She is said in Fragment 13 to have created Love first. Note that Parmenides retains personification.

Empedocles identifies four simple elements (earth, water, air and fire) which are eternal and uncreated. He then explains the processes of the physical world as the result of a cohesive mixing of the elements under the influence of Love, a form of binding energy; their reciprocal dissolution is caused by Strife, or separating energy. The elements themselves remain constant, but their proportions continually change in any given body. Love and Strife are thus conceived as creative and destructive forces, although Empedocles personified them and actually uses the personal name Aphrodite instead of Love in some of the fragments.

Clearly, both Parmenides and Empedocles found the use of mythological personification acceptable in their efforts to explain the physical world. I note that both also used a mystical poetic style and thus even in language are more closely related to the mythic approach of earlier thinkers who also used poetry, than to Aristotle, whose own writing style is a complex and pedantic prose.

By the Fifth century, especially in Athens, there was vigorous debate focused on human abilities and institutions. The notion of history, as opposed to simple chronicle, was being formalized by Herodotus. The tragedies of Sophocles and the construction of the Parthenon all belong to this century, as does the great struggle between Athens and Sparta which we call the Peloponnesian War. The nature of reason was much discussed. What is a human being and how should one be educated were questions for debate.

That brings me to the third early philosopher, Anaxagoras. He was a friend of Pericles, and identified Mind as the organizing principle of the universe. "Mind took command to impart revolving motion to all things," is the way he expressed this in Fragment 12. The phrasing in this and similar fragments makes it certain that Anaxagoras saw comprehensible patterns in the phenomena of this world which could imply both natural order and comprehensible purpose.

The recognition of order in this natural world did not necessarily result in eagerness to advance the study of its various phenomena, however. One group of Greek (and Near Eastern) thinkers arrived instead at the position that the world of natural phenomena is ultimately unknowable. In some cases, the conclusion was reached through their awe of creative divinity. This they considered so far separated, and so different in kind, from created humans that creation itself was beyond human understanding.

Much Mesopotamian religious poetry demonstrates this conclusion. One also finds it in the Biblical wisdom literature and the Psalms, though the Hebrew tradition adds the profound insight that the Creator Himself bridges the gap between man and God by His willing manifestations within the historical framework.

For other thinkers, the goal of understanding the physical world became logically impossible because sense perception presents too many variables. Certainly, if my hand is cold when I put it into tepid water, the water will seem warm, while if my hand is hot, the same pail of water will seem cool. Such inconsistencies led to the conclusion that data received through the senses would not lead to any true comprehension of the universe. Among the Greeks, Parmenides had set out grounds for this, and Plato's elegant dialogues demonstrate his logical expansion of it.

Plato describes a world of Ideal Forms comprehensible by a trained intellect as the true and ultimate reality. He considered this physical world a deceptive, shadowy reflection. But treating data from sense perception as invalid was of little use to those whose interests were practical. As Aristotle would point out, we are obliged to live in a world of discrete sense perceptions and particular circumstances. If we ignore the facts in any specific circumstance, universal truths frequently serve only to confuse when we seek a specific course of action.

Further, in the study of medicine and astronomy careful observation and rigorous analysis of data were essential. Thinkers in these empirical fields tried consciously to avoid attributing what they didn't understand to divine action, because that seemed to

close the door to further understanding. Very few denied divine existence, but they focused instead on a search for natural explanations derived from observation.

The most radical of Aristotle's predecessors was Democritus of Abdera. Of all the Pre-Socratic Greek thinkers, the loss of his work is most regretted by historians of science, because his insights have tantalizing points of contact with modern physics. He discarded all previous concepts, and postulated matter as irreducibly minute particles instead (literally "uncuttable": atoms). These vary in size and shape and move randomly through the void. The atoms are eternal—thus uncreated—and unchangeable, uncountable in number and variety. Some adhere easily to each other and some do not, and their combination forms the physical universe. Democritus did not (apparently) explain what imparts motion to his atoms, but his followers stated that atoms possessed an inherent ability to swerve randomly.

Democritus had made an astonishing leap into abstraction by postulating a form of matter so far beyond the range of his observation. His ability to discard all previous approaches had a catalytic effect on Greek speculation. His explanation of the universe was mechanistic and allowed no scope for any divine role, but few Greek thinkers were ready to eliminate the gods entirely, even though concepts of divinity had progressed far beyond Homer's amoral superhumans. Aristotle evidently found Democritus' work deeply disturbing, and much of the justification for his own system is presented through his direct refutation of Democritus' ideas. A world without some divine contribution was too unsettling, and observable natural order argued against so random and accidental a universe.

Let us now turn to Aristotle himself, remembering that he was the son of a doctor, raised at the royal court of Macedonia, and perhaps never the citizen of any Greek state. He studied with Plato in Athens for a number of years, wrote extensively on marine biology, and served as a tutor to Alexander the Great before he opened his own school in Athens.

When Aristotle wrote, some 375 years before the birth of Christ, his acceptance of evidence from the physical world put him squarely in opposition to his teacher, Plato, since Plato's approach to knowledge denied that our physical world has validity: it changes constantly, and thus lacks ultimate reality, according to Plato.

Aristotle's insistence that what we can experience is valid and ultimately real aligns him with other empiricists—the medical writers like Hippocrates, and the astronomers like Eudoxos—who recorded observations precisely and theorized cautiously from this body of collected evidence. Aristotle himself was aware that sense perceptions, uncritically handled, could lead to false conclusions. To guide the process of such reasoning, he formulated the tools of logic which make systematic analysis and the testing of hypotheses possible, creating rules against which conclusions can be measured.

Aristotle's system retains a role for a rational, purposeful and beneficent creator, although this is not his emphasis, and he reaches this conclusion based upon carefully reasoned argument. He proposes to explain what <u>is</u>, rather than how it came to be.

It is his custom to open a treatise by reviewing the work of predecessors, and he does this in greater detail in the <u>Metaphysics</u> than he usually does, for this is the work in which he discusses most generally the ramifications of his own system. His historical review is presented as a process of growth in understanding from simple notions farther back in time, to more complex ones nearer his own time. In this scheme, Democritus

represents an extreme beyond the reasonable middle point: Aristotle's own system can be seen as the logically mature culmination of previous thought—the balance point, the mean.

His analysis is orderly, a formal scheme of pairs of thinkers, each pair identified with the effort to determine the basic material from which all things come. The first answer given is that water is this primary substance. The next two speculative thinkers are said to have held that it was air, while the third pair concluded that this was fire. Their effort to identify a single material out of which the multiplicity of physical phenomena can be explained, rather than accepting a mythological explanation, sets these thinkers apart from the earlier Babylonian and Egyptian thought.

The next Greeks (including Parmenides, Empedocles, Anaxagoras, and Democritus) are described as moving toward more abstract notions, allowing Aristotle to present his own system as the logical result, an organized and coherent edifice built on previous work.

Here then, is Aristotle's own worldview, compiled from references to it throughout the works dealing with the physical universe.

The universe is spherical in shape, with the spherical earth at its center, and it is made up of the four primary materials we have noted above, plus an even less dense form of matter than fire, aither. This forms the outer envelope of the sphere. The aither contains the stars and celestial bodies, and is the only one of the concentric shells to rotate. It does so from east to west, thus accounting for the rising and setting of the heavenly bodies, and for the sun's path along the ecliptic, which causes the seasons.

Aristotle says in <u>On the Heavens</u> (de Caelo 2.7 to 2.10) that the sun, moon and seven planets each move in perfectly spherical orbits generated by their contact with each other, their motion having been originally imparted the outer-most sphere. Since something which does not move must ultimately be present to impart first motion, an unmoved mover must be present outside the sphere of rotating aither, in which the fixed stars are found.

He retained the older four elements, of which earth and water are the densest and form the center two spheres, while fire and air, being more rarefied, make up the outer shells. His system is far more complex than this, however. The four opposite qualities, originally postulated by Anaxagoras, are also basic: Hot, Cold, Wet and Dry. Aristotle uses them in connection with a form of undifferentiated matter he calls hule or building timber: "stuff." The formula which he gives to account for the observable phenomena in our physical world is <u>hule</u> + Hot + Dry = Fire; <u>hule</u> + Hot + Wet = Air; <u>hule</u> + Cold + Wet= Water; and <u>hule</u> + Cold + Dry= Earth. In this system like is attracted to like, and small moves toward larger.

Aristotle recognizes that in its pure state, this would result in a static universe, with concentric spheres of simple earth, water, air and fire enclosed within the aither. The energy causing physical change to occur is provided in his system by the rotation of that outer sphere (the location of the fixed stars); that motion is imparted through contact to the next sphere which moves the next and so on. In our world, change is caused by the sun's movement, generating heat through the friction of its rotation. Thus, the sun's heat or lack of it is the cause of physical compounds coming into existence or dissolving as they decay. The sun's passage by day and the cooling produced by its absence at night,

coupled with the seasonal variations in its intensity, cause the multiplicity of forms which we see around us.

It is clear from this summary that Aristotle had come at the problem of the Many forms seen in unending change, and efforts to identify the One primary matter underlying all forms, from a fresh perspective. Our physical universe contains life and demonstrates change, both of which Aristotle approached from his study of motion, calling it the primary form of change in On Generation and Corruption 336a.

He began the investigations which ground his thinking in the biological sciences, and his system organizes phenomena into living things—defined as possessing some form of soul—and non-living. Living beings are then arranged by genus and species. The human species is the most complex, having the highest part of soul, the rational, in addition to the self-nutritive, the self-moving, and the sensitive parts in common with other forms of life. Aristotle's study of those especially human concerns, ethics, and politics, flow from his discussions of life forms found in the Physics, various treatises on physical nature, and his essay On the Soul.

Not surprisingly, since his data are observable phenomena which must be described in words, precise definition of these words forms a significant part of his discussion. His goal in these passages is always to illustrate a term as the mean between two extremes. I note here that his acceptance of perceptible phenomena includes the recognition that words are given meaning through common usage within a society, and he sometimes demonstrates how such common uses functioned in his own world. He uses analytic logic, scorning dialectic as imprecise, and always reviews previous thinking on a subject before presenting his own reasoned conclusions, which are based upon carefully organized observations.

Let me share some particularly intriguing passages with you gleaned from my re-reading of ten of the most significant works as preparation for this talk. I shall offer these quotations in the order that is generally agreed by scholars to represent Aristotle's arrangement from most basic elements to concepts built on these.

1. On Generation and Corruption 315a30: Coming into being and passing away in an absolute sense, must also be discussed…as also the other simple forms of change, such as growth [i.e., change of quantity] and alteration [change of quality]. Plato investigated things coming to be and passing away, but only as these changes are inherent in things, and he did not consider all coming into being, but only that of the elements. He says nothing about how flesh or bones or any other such [compound] things came to be; nor did he further examine the manner in which alteration or growth are inherent in things. No one else has paid more than superficial attention to any of these except Democritus." (1.2)

On Generation and Corruption 316a5: "Lack of experience lessons the ability to comprehend admitted facts. Hence those who concentrate their energies upon natural phenomena are increasingly able to formulate underlying principles which are all-encompassing; while those who are unobservant of the facts from devotion to abstract discussions, are easy to refute on the basis of too few observations." (1.2; this passage continues by illustrating the critical differences between empirical inquiry and Plato's dialectical methods.)

On Generation and Corruption 330a13: "The terms 'dry' and 'moist' have several meanings, for both 'damp' and 'moist' are opposite to 'dry', and again, 'solidified' as

well as 'dry' is opposed to 'moist.'...For 'moist' is that which contains moisture of its own deep inside it ('soaked' being that which has been penetrated by exterior moisture), whereas 'solidified' has been deprived of inner moisture. So then, of these, the latter comes from 'dry' and the former from 'moist.' It is clear then that all the other differences can be reduced to the primary four [qualities, Hot, Dry, Cold and Wet]." (2.2; I confess I can't read many pages of such definitions without wanting to rest my eyes and send out for pizza.)

2. On the Heavens 281b26: "Thus anything which always exists cannot pass away. Also, it has not come into being, since if it had, it would be able to not exist at some time." (1.12; the discussion here concerns the heavenly bodies sun, moon, planets and stars.)

3. Physics 207a7: "The unlimited is that beyond which there is always something more, no matter how much has been taken away. That of which there is nothing beyond, is complete and whole. For thus we define the whole: that from which nothing is wanting, such as a whole man or a whole box. And just as with each individual whole thing, so it is of The Whole—the universe. The whole is that which has nothing beyond it. To be "whole" and to be "complete" is either absolutely the same, or very nearly so, for nothing is complete unless it has an end, and the end is a limit." (3.6)

Physics 257a25: "The first moving thing will take its motion either from something at rest or from itself. But if one needed to decide which of these... is the cause and principle motion, then everyone would say the latter: for that which is the cause by itself is always prior (as a cause) to that which only derives this power from something else." (8.5; this discussion of the First Mover climaxes in chapter10)

4. On the Soul 402a5: "It appears that knowledge of [the soul] contributes greatly to the whole body of truth, especially to our understanding of Nature, for the soul is, in a sense, the ruling principle of living creatures." (1.1)

On the Soul 412a25: "The soul is the first actuality of a physical body that has the potential of holding life." 412b10: "It is actual substance corresponding to the formal definition of a thing." 413a3: "...the soul and the body are the living creature. Thus it is not possible that the soul can be separated from its [living] body - at least, some parts of it cannot." (2.1)

On the Soul 413b10: "The soul is the source of and has been defined by the traits of metabolic process, sense perception, movement and cognitive thought." (2.3)

On the Soul 427a1: "Two distinctive qualities define the soul - movement with regard to place, and the power to reason, think and perceive. To think and to distinguish are both considered a kind of perception." 427b25: "[However], thinking is different from perceiving and is held to be partly speculation, partly discernment." (3.3: Naturally, Aristotle carefully defines all of these terms through logical argumentation and illustrations.)

On the Soul 432a1: "Thus the soul is just like a hand; for as a hand is a tool of tools, so the mind is the image of images and perception the image of things perceived....Thus, without perceiving something one would not learn or comprehend." *Categorically different from Plato's disregard for sensory perception!* "Whenever one ponders anything the mind is necessarily aware of it along with some mental image; for images are just like objects of sense perception except that they have no material

substance." (3.8, which is a summary of preceding chapters. Note that this is categorically different from Plato's disregard for sensory perception!)

5. Nicomachaen Ethics 1098a14: "We state that the task of a human being is [to live a certain kind of life, and this is an activity of the soul making use of reason...thus human good turns out to be an activity of the soul in accord with excellence, and if there is more than one form of excellence, then in accord with the best and most perfect." (1.7)

Ethics 1109b9: "But where and how greatly one may go off course before he becomes blameworthy is not easy to determine by reasoning, for it is no different from any other sense perception; such things depend on particular facts, and the decision rests with perception. This, however, is clear: that it is necessary to lean toward the middle point in each commendable act so that the course is neither toward excess nor deficiency. Thus we shall most easily hit the mean, shooting well." (2.9)

Ethics 1114b21: "In general then, we have briefly discussed the nature of the excellences (i.e., they have been defined as mid-points between two vices, and as permanent characteristics of the soul). From this it follows that they generate actions in accord with themselves and as sound reason may enjoin, and that they originate in ourselves, and that they are consciously chosen. But actions and character traits are not voluntary in the same way; for we are masters of our actions from the beginning right to the end, knowing the circumstance in each case, but though we control the beginning of character traits, we are as unaware of their development as we are of a disease. However, because we did have the power to choose a course of action, in this sense our character traits are voluntary." (3.5 I have translated *aretai* as "excellences" rather than the more usual "virtues," since the Latin word lacks the breadth of the Greek and carries notions added since Aristotle's time.)

Justice is one of the most important character traits, and Book 5 deals with this moral excellence.

Ethics 1129a3: "We see that everyone is willing to say that justice is that state of character out of which comes the actions of virtuous men and from which they behave honestly and wish for what is just..." (5.1 Note here that Aristotle accepts not only the perceptions of an individual, but also those common to groups; the validity of such "common sense" is clearly demonstrated throughout his discussion in the Ethics. It would be hard to get farther from Plato's approach to the topic than this!)

Ethics 1134a1: "And justice is that according to which the just man is called a doer by conscious choice of just acts, and one who will make a proportionate distribution of things, giving others a share equal to his own portion, the same way to one as to another."

Ethics 1134b8: "The justice of a master [toward slaves] and that of a father [toward children] are not the same as political justice, though they are similar; for there is no 'injustice' towards one's own possessions, but a man's slave, and his child until it is of age and moves out, are so to speak, a part of himself and no one chooses to hurt himself." (This is an interesting assumption, and one never questioned by Greek thinkers.) "Political justice [as we have said] exists in established law...So justice can rather be shown towards a wife than towards children and slaves, for then it is household justice; but even this is different from political justice." (5.8 Note that wives are not chattels, but since they cannot be citizens, they are not "equals" in the sense that male citizens are equal to each other.)

Whether an act is voluntary or involuntary - that is, where conscious choice enters - is very important to Aristotle, and his discussion of this shows awareness that external compulsion removes the power of rational choice; he is sensitive to what this means for the powerless.

I confess that re-reading Book 6 of the Nicomachaen Ethics as I was writing this really excited my sense of wonder: great stuff there! Consider this, in light of our multidisciplinary new Common Curriculum, from 1139b: "Let it stand that the soul affirms or denies truth through five states of character: art, scientific knowledge, practical wisdom, philosophic wisdom and intelligence (the other two, supposition and opinion, are states in which we may be mistaken)." (6.3.1) At 1147a he points out that it is possible to have sound reasoning and to act against one's own knowledge, if one's reasoning is based upon a universal premise, but the action requires attention to the particular "for it is particular acts that have to be done."

Books 8,9 and 10 provide the transition to his work on politics, and it is important to remember that Aristotle conceived of Nicomachaen Ethics and Politics as interconnected works. Before commencing this, he had made a detailed study of roughly 150 actual constitutions and the histories of those city-states living under them. As always, his discussion is based upon empirical data.

While there are references to Plato throughout the body of Aristotle's work, in the Politics we find a particularly detailed examination of Plato's thinking on this subject. It begins in Book 2, and I recommend this section to anyone who has found Plato's Republic unsettling at some point: the clarity of his criticisms may be helpful. As always, he defines his terms with great care and his illustrations are especially illuminating to a modern reader who lacks Aristotle's own immersion in the culture of the Fourth century Greek world.

Being Aristotle his main concern is with forms of government which actually exist, not with the ideal. True, he notes what would be ideal at a number of points, but always continues with a return to how things really are. One assumption which he never questions is that the best form of government is the most stable one; thus, it falls in the middle between extremes of all kinds. Having defined terms, identified various forms of government and their strengths and weaknesses, he turns to analyze how governments are changed.

Book 5 of the Politics provides his thinking on circumstances leading to revolution. He opened this book by observing that "Many constitutional governments have come into being through everyone agreeing that proportionate quality is just, but failing to achieve this goal..." Chapter 1 of Book 5 finishes thus: "Everywhere factional discord comes from inequality, where a proportionate share is not held by those who are unequal (even an inherited kingship is unequal if held among equals). Certainly people seeking equality create civil discord, but two kinds of equality exist, one numerical and the other by worth. By numerical I mean that which is equal by the same percentage [or proportion]....Although people agree that equality by the same percentage is completely just, they disagree in that some say if they are equal in any way they are equal in all, while others say if they are unequal in any way, they are unequal in all ways."

He is discussing Democracy and Oligarchy in this fifth book, and in Aristotle's world a polis often see-sawed between them depending upon the strongest group of citizens any one time. Aristotle sees equality in mathematics terms, and since humans are

not simple clones, absolute equality is impossible in any sense. He concludes from the evidence that numerical equality is best in some areas and equality by proportional worth (percentage values) in others. He concludes that democracy is safer and more stable than oligarchy, finishing chapter 1 by saying, "Further, government by the few, for which reason it is the safest of these [actual] constitutions." The framers of our own constitution knew their Aristotle well.

Politics 1310a25: "Democracy is defined by two things, the principle that the majority rules, and freedom; then justice is considered equality (equality means that whatever is voted by the majority is binding), while freedom is everyone doing whatever he wants. But this is terrible: one ought not think it slavery to live under constitutional rule – rather, it is salvation."

That is a statement startling for its passion and anguish. Behind it is the specter of Athens in the years from 415 to 390 BC. Behind it is the knowledge of scores of Greek poleis – their constitutions and their bloody histories – as well as many non-Greek states around the Mediterranean, and Aristotle's personal experience with the kingdom of Macedonia.

Plato looked at human cruelty and folly and turned away in disgust to contemplate an Ideal world accessible to a privileged few. Aristotle looked at human cruelty and folly and refused to do that. His work deals with what is possible, and the possible is based upon his confidence in the order of this universe plus his conviction that the human soul has the power to grow in wisdom. His technique is to identify the ideal, dismiss it with a regretful sigh, and move on to "what exists." He struggles to develop precision and to hone vocabulary, always trying to approach subjects without pre-judgment, but to draw conclusions based on logical analysis and factual data.

I find the places in which Aristotle offers criticism of the dialectical methods of pursuing truth especially interesting. He did, after all, spend nearly 20 years studying at Athens with Plato, and certainly knew the elegantly constructed dialogues in which Plato made his ideas available to a wider public. He chose not to use the same format for his own writings, because conversational usage was not precise enough, and he did not feel that the method led to truth. Imprecision allows ambiguity, both in reasoning and in lexical meaning, and since human activities in the physical world are themselves ambiguous, the tools with which we seek to understand them must be as precise as possible.

Plato, that blue-blooded Athenian aristocrat, had a very different approach. Plato, whose childhood years were spent during Athens' most radical democratic government under the direction of demagogues; whose close relatives were implicated in the bloody oligarchic battles against the constitution, and whose beloved Socrates was condemned in a lawful trial. Plato was not optimistic about human abilities in general. He saw little hope in the actual practice of governments and devoted his life to pure researches carried out by trained minds. The perfection of mathematics and his conviction that only the perfect has ultimate value directed him toward a far more mystical vision than Aristotle chose to embrace.

Aristotle refused to dismiss the physical and in so doing turn away from an imperfect world. He found hope in the powers of human reason and his belief that – at the very least – enlightened self-interest will point the way to human improvement. For

him, that hope is rational because a rational deity began it all, and there is a rational purpose in creation.

I believe that one strength of the western intellectual tradition is the presence of both Aristotelian and Platonic perspectives. Both, I think, are essential and both teach us to move beyond mere acceptance of ordinary life in significantly different ways. Plato points us to God in the breadth of his vision of absolute perfection, but at the cost of discarding ordinary humanity and the imperfection of human institutions. Aristotle gives us tools of reasoning and shows us God working though the beauty of the creation and in our own efforts to understand His world – and improve ourselves.

But in the end, it is Aristotle's sense of wonder and his insistence that this is the great motivating element in the human search to understand, that endears him to me, for wonder opens the doors of the spirit to God, and the doors of the mind to compassion for His world.

Bibliographic notes:

While the best contemporary translations of Aristotle are in the Penguin series, not all of Aristotle's works are available yet. The most complete and accessible source remains the Loeb text series, which includes Greek on the left page and English translation on the right. For Greek scholars, the Oxford text editions are standard.

The best introduction to Aristotle's thought is found in Robinson's Aristotle in Outline (Hackett, Indianapolis, 1995), which includes an excellent bibliography. Grene, M., A Portrait of Aristotle (University of Chicago Press, Chicago, 1963) is also helpful. Pre-Socratic texts are available in translation in Kathleen Freeman's Ancilla to the Pre-Socratics, and discussion of early Greek philosophy can be found in Kirk and Raven's work, The Pre-Socratic Philosophers.

APPENDIX

PARMENIDES

OPINION / TRUTH
(Goddess + Light + Night) (Total Perfection; Sphere)

EMPEDOCLES

Love binds elements into compounds
Strife dissolves compounds into elements

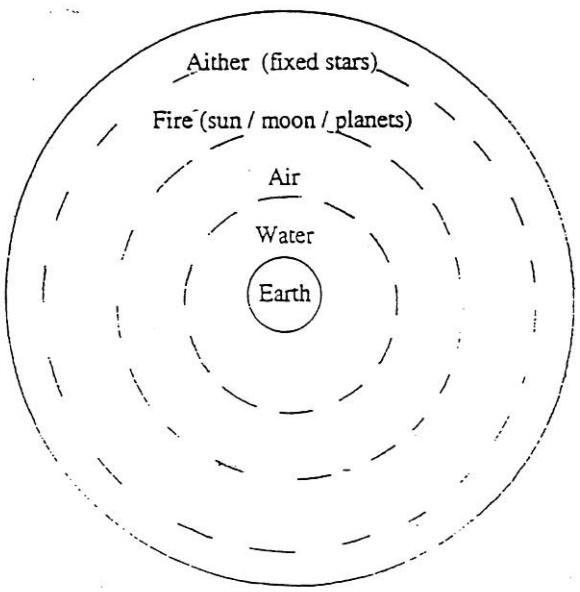
ANAXAGORAS

Mind Creates Order

DEMOCRITUS

Void / Atoms / Random Swerve

ARISTOTLE



Earth = hule+cold+dry
Water = hule+cold+wet
Air = hule+hot+wet
Fire = hule+hot+dry