Scientific Enlightenment, Div. One
Book 2: Human Enlightenment of the First Axial
2.B.1. Chapter 1
The Presocratic philosopher Anaximander
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With the Ionian Presocratics a leap beyond mythic religiousness is achieved in two ways: the anamnesis of the law of Conservation comes one step closer to its truth and a mechanical understanding of the cosmos -- again, coming closer to truth -- comes to replace the mythic, personalized understanding of the cosmos as peopled by gods and spirits. A third theme in our study of Hellenic philosophy is the differentiation of intraworld concern ("eternal maintenance of the present") into a salvational one (the negation of the present once and for all). This differentiation of salvational concern is however not yet evident with the Ionian Presocratics but occurs shortly after their time.

1. General statement on the Presocratic Ionian way: the beginning of the philosophical anamnesis of Conservation

Across all philosophies and religions one is always struck to see the repetition of the same image or the same theme: the image of the Source of being as the Infinite, the Eternal, Being, God, The Unchanging, Taiji (the Ultimate), the One, *Brahman* etc. It is as if there is but one thought -- and we demonstrate here that that "one thought" is the recall (*Anamnesis*) of the law of Conservation. Any talk of the Infinite, the Boundless, the Source, etc., is reflective of the recall of the first law of thermodynamics: that despite all changes, and behind all the disintegrations of order, nothing *really* changes at all, nothing really gets destroyed, everything is conserved; the net amount is always conserved. "God", as passed down from the Mosaic theophany, is the same recall but this fact is obscured because in the testamental religions God is other-ized. But the Christian theologians of the Medieval period have demonstrated clearly (usually in the form of "proof for God's existence") that the God of the testamental theophany has the same experiential origin (the recall of Conservation) as the philosopher's Being or Source by showing the coincidence between the two: e.g. St. Thomas Aquinas' "the essence (*essentia*) of God is to-be (*esse*)", or Augustine's "God as the summit of beings" (being-ness, *summa essentia*); so have the Kabbalists clarified God as the En-Sof (Limitless or Boundless).

Anyone who has thus far failed to see the memory of the first law in these symbolic expressions should turn to the Presocratics, whose recall of Conservation is the purest and most recognizable as such -- with the minimal amount of baggage. The task that the Presocratics set for themselves is, of course, the search or articulation (i.e. recall) of the Underlying (*hupokeimenon*) or the Source (*arche*: origin, beginning). Aristotle summarizes this task succinctly:

> That of which all things consist ("of which all beings are"), and from which they come into being and to which they return upon destruction ("to which they are destroyed at the end"), while this being itself under-remains and merely undergoes affectations, this they say is the element (*stoicheion*) and source (*arche*: source, beginning, origin) of all things, and *nothing is either generated*

> *or destroyed, since this source always persists* (*sozomenes*: is preserved, saved). (*Metaphysics*, I III 3-4)
>
> εξ ου... εστιν απαντα τα οντα, και εξ ου γιγνεται προτου και εις ο φθειρεται τελευτατον, της μεν ουσιας υπομενουσης, τοις δε παθεασι μεταβαλλουσης, τουτο στοιχειον και ταυτην αρχην φασιν ειναι των οντων, και δια τουτο ουτε γιγνεσθαι ουθεν οιονται ουτε απολλυσθαι, ως της τοιαυτης φυσεως αει σωζομενης...

"Nothing is ever generated nor destroyed, the underlying substratum (source) always persisting": this is the philosophical, pre-scientific articulation of the law of Conservation; whenever things are destroyed, the matter of which they are made still continues and will serve to form other things in the future; even when the matter itself is completely annihilated such as during high temperature, it is simply converted to an equivalent amount of energy in accordance with Einstein's $E = mc^2$, which is the latest, final (scientific) articulation of the first law of thermodynamics: the conservation of matter-energy.

Note that the limitation imposed by the law of Conservation -- that nothing can come out of nothing and that therefore everything there is must have always been there: the necessary eternity of the substratum -- eventually might have to pass into the intuition that that "primordial everything" must have come into being from nothing. For the importance of this, later. That the foundation of Greek philosophy is the intuition of the principle of conservation has occasionally been noted by some physicists, such as Alan Guth in his *The Inflationary Universe*:

> Although the generally accepted big bang theory holds that the observable universe emerged from an explosion some ten to twenty billion years ago, the theory nonetheless assumes that all the matter in the universe was present from the start [obviously because of the law of Conservation]. The classical big bang theory describes the aftermath of the bang, but makes no attempt to describe what "banged", how it "banged", or what caused it to "bang"...
>
> The difficulty in constructing a scientific theory for the origin of matter stems from a set of rules, called conservation principles [of matter/ energy], that trace their origin to the very roots of science itself.
>
> "Being is ungenerable and imperishable," wrote Parmenides in about 500 B.C... The basic idea, that things which exist continue to exist, became a cornerstone of the concept of natural order. Objects would not appear and disappear unpredictably, but instead would evolve continuously according to principles of nature. [Recall Aristotle's summary of the Pre-Socratics: "... nothing is ever generated nor destroyed, since the source always persists..."] This notion of continuity in existence became more concrete a century later in the work of Leucippus and Democritus, who advanced the theory that all matter is composed of eternal, indivisible atoms which move through an otherwise empty space. These ideas are reflected strongly in Lucretius' *De Rerum Natura*... during the first century B.C., which includes the statement that "Nothing can be created from nothing." ["... nullam rem e nihilo gigni diuinitus umquam", 1. 150: "... nothing is begotten from nothing, not even by divine influence".] Lucretius went on to explain that "Material objects are of two kinds, atoms and compounds of

> atoms." [*The atoms themselves are preserved indefinitely in accordance with the law of Conservation.*]
>
> While the fundamental idea of continuity in existence can be traced back to the ancient Greeks, it was not until much later that this line of inquiry evolved into the conservation laws of modern science... (p. 2 -3).

That the principal motivator of Greek philosophy -- and in fact of all philosophies and all "religions" across all civilizations -- i.e. the first law of thermodynamics, is casually comprehended by a physicist as a side issue and yet escapes most students of philosophy today is a strange phenomenon. It actually has a very specific historical cause: the ignorance of the experiential content of past philosophies, their literalization into sets of propositions judged for their internal logical validity, their distortion into references to empirical *objects* -- these under the influence of positivism -- and the specialization of the "discipline" of philosophy by which philosophy becomes understood only within its internal categories and loses contact with the external reality it is about.

Guth goes on to narrate the consolidation of the principle of conservation first of matter in John Dalton's table of atomic weights and then of energy by the middle of the nineteenth century; and finally, when Einstein showed in the theory of Special Relativity that mass and energy are really just two facets of an underlying phenomenon and so interchangeable, the consolidation of the principle of conservation as of matter together with energy, with matter able to disappear as long as energy is increased proportionally to conserve the total amount, and vice versa.

2. Anaximander

We shall start with Anaximander, whose anamnesis is the purest. (The following review of the Presocratics is based, unless otherwise specified, on *The Presocratic Philosophers: A Critical History with A Selection of Texts*, by G. S. Kirk and J. E. Raven)

Anaximander says that the source and element of all beings (αρχην και στοιχειον των οντων) is the apeiron, or the Limitless/ Boundary-less/ Without-Definition. Apeiron is therefore the Hellenic equivalent of the Dao of Laozi on the Sinic side. From the apeiron come all the heavens and all that is in the cosmos. This source for the coming-into-being of beings is also that into which destruction happens according to necessity. (εξ ων δε η γενεσις εστι τοις ουσι, και την φθοραν εις ταυτα γινεσθαι κατα το χρεων.)

Again, memory of the law of Conservation gives us the experience of the "substratum" or "underlying". The first law of thermodynamics means that nothing can come into being out of nothing -- which is to say that anything that comes into being must not be anything new but must be something that is already there (the law of Conservation does not permit creation *ex nihilo*); and that nothing is actually ever destroyed, for the amount of everything must always be conserved. Hence coming-into-being and passing-away is only the reshuffling here and there of an underlying constituent, merely the substratum manifesting itself here and now in this form and then and there in that form and then retracting these manifestations back to itself: *a substratum must be posited*.

In today's scientific (structural) perspective, this "substratum" is just energy: $E = mc^2$ means just that matter (and so any of the "things" around) is simply a more concentrated form of energy, which is forever conserved in the same amount. The philosophical anamnesis of Conservation therefore results in the thinking that Being is One and Eternal.

Anaximander's recapitulation of Einstein's equation of relativity is the synchronic aspect of his anamnesis of Conservation.

On the diachronic axis the substratum sought after by the philosophers (here in Greece but also elsewhere) is interestingly reminiscent of the modern day grand unification theories of physics, where forces (electromagnetic-weak-strong-nuclear forces) and constituents of matter (the subatomic particles of the standard model) are to lose their distinctions from one another and be seen as manifestations or aspects of an underlying field (whatever it is) in lower temperature when symmetry is broken. (Gravity, which represents negative energy and thus, so to speak, negative existence, is to be excluded from current considerations, since "apeiron" is only "positive existence". The significance of this will be seen later.) Or in another way the apeiron corresponds to the "hot soup" of the radiation era of the Universe before matter crystallizes out of energy. Philosophy recapitulates on a synchronic axis modern cosmology (or theoretical physics) which traces the "origin" on the diachronic axis, as will be seen in more detail later. This is because the deep truth about the structure of Reality does manifest itself in some vague way (i.e. as the law of Conservation) on the macroscopic level sensible to human beings so as to enter human intuition and become a "memory". Thus the memory of the first law, in addition to its generation of salvational search, contains also the vague truth about the structure of Reality. Specifically, the mysterious one-ness or whole-ness of All which is moreover eternal. (This is where we will say that salvational thought must also in some way reveal the structure of Reality instead of obscuring it as do testamental religions, which are then inadequate.)

Furthermore, Anaximander says:

> ...beings give to each other judgment (*dike*) and recompense/ punishment (*tisin*) for their injustice (*adikias*) according to the necessity of time (κατα την του χρονου ταξιν). (Simplicius *Phys.* 24, 13)

(Liddell and Scott [*Greek - English Lexicon*] define these terms: *dike* = custom, usage; after the manner of... [and so the meaning of *dike*, as part of apeiron, also forms part of the Chinese Dao]; order, law; judgment, trial. *Tisis* = payment made by way of recompense, a penalty, punishment. The source of being is always also experienced as determining its *order*.)

This is a succinct statement of what we have said already: the idea of justice (just like karma, guilt, and repentance) came from the memory of equilibrium in general, not distinguished from Conservation in particular. The original state (amount) must be conserved, so that any disruption of the original equilibrium in terms of one being taking advantage of another will be evened out by the reverse, the equivalent disadvantage of the advantage-taking being or the equivalent advantage for the disadvantaged being at the (equivalent) expense of the advantage-taking being. Time will ensure retribution because Conservation or equilibrium is the law of nature. Justice, and this passage of Anaximander, results from the application of the first law of thermodynamics in functional perspective (i.e. to effects of structure rather than to the structure itself as modern day scientists do). Anaximander is here basically applying back to things the karmic thinking which originally derived from the equilibrium-process among things and got applied to human fate as also some sort of thing. This passage then is a symbolic expression of the memory of a fundamental structure of nature, and so it is not productive to try to decipher its meaning by identifying what exactly inflicts injustice on what (different seasons, different worlds, etc.).[1]

This "fundamental passage in the beginning of Western metaphysics" really is no mystery if, again, we think of the example from quantum physics already discussed: an electron can pop into existence

as an "extra" from the eternally conserved level of energy of the Universe (even from vacuum) through the uncertainty in energy ΔE during time Δt ("that from which the genesis of things comes") if its extra (negative) charge is evened out by the simultaneous genesis of a positron ("beings pay each other recompense for their injustice to each other") *and* if they both disappear after the allotted time Δt to return their "extra existence" to nature ("that into which beings return upon destruction by *necessity*" and "they pay recompense... according to the necessity set by time"). It is the same memory of *eternally necessary Conservation* (more clearly than that of equilibrium with *this* example) that underlies here the "dictum" of Anaximander and there the sacrifices of primitive Homo sapiens sapiens to the Ancestral Ghost.

Apeiron, as Conservation, is thus eternal and unaging, and surrounds all the world (*tous kosmous*). (Hippolytus *Ref.* I, 6, 1- 2)

The substratum, from which all beings come to be and to which they return upon destruction, and of which they are mere temporary and (spatially) limited modifications/ manifestations, is of course eternal, because of the necessity of Conservation and since it is the matrix or source of being that is conserved, necessarily and *thus eternally* -- because the law of nature is such that the "total" must be conserved. Substratum is "surrounding" the cosmos, obviously, because it is the source of it all: by necessity nothing is beyond it (for the first law: nothing can come out of nothing); it is hence called "the Infinite". This is a symbolic expression of the omnipresence of the substratum (since it is the matrix), and should not be analyzed into quantitative or mathematical kinds of speech (e.g. debating about whether it is spatially infinite or some other kinds of infinity, or "whether the concept of infinity was apprehended before questions of continuous extension and continuous divisibility were raised by Melissus and Zeno"; Kirk and Raven, ibid.).

Furthermore, Anaximander attempts to stay pure to the memory by saying that apeiron is not any of the elements water, fire, air and earth (*to para ta stoicheia*: the besides-the-elements). This is purely experiential (Conservation is Conservation of all elements; it is Conservation by itself); and logical arguments such as that the infinite primary substance, if identified with a specific world-constituent [element], would swamp out the others because of the oppositional characters of the elements, as between water and fire (ibid., p. 113; Aristotle *Phys.* Γ5, 204), are secondary and not originative of the fundamentally phenomenological assertion about apeiron.

The apeiron naturally has no beginning (since it is the eternally conserved substrate of existence: nothing can come out of nothing and everything there is must have always been there) and is identified with the divine, for it is immortal and indestructible (ανωλεθρον), and also because it "steers all". (παντα κυβερναν; Aristotle *Phys.* Γ4 203b7) We will get into this point when we discuss below the similar ideas of Thales and Anaximenes.

Anaximander's thinking that beings came about (in pairs of opposites -- here apparently the elements fire, air, water, and earth which are opposed to each other in quality) through separation from the source is just the recall of the memory of the first law that things which appear here and there and then disappear later here and there are merely the reshuffling of the Underlying. E.g. Aristotle *phys.* A4 187a20: οι δ'εκ του ενος ενουσας τας εναντιοτητας εκκρινεσθαι... "from the one in which they are, the opposites are separated out..." And Simplicius *phys.* 24,21: "For he does not produce the coming-into-being from the alteration of elements, but from separation off of the opposites through eternal motion." (ουτος δε ουκ αλλοιουμενου του στοιχειου την γενεσιν ποιει, αλλ'αποκρινομενων των εναντιων δια της αδιου κινησεως.)

3. The differentiation of the philosophical cosmogony from mythic cosmogony

> "That which is productive from the eternal of hot and cold (το εκ του αιδιου γονιμον θερμου τε και ψυχρου) was separated off at the coming-to-be of this world, and that a kind of sphere of flame from this was formed round the air surrounding the earth, like bark round a tree. When this was broken off and shut off in certain circles, the sun and the moon and the stars were formed." (Plutarch *Strom*. 2)

Kirk and Raven explains this Anaximanderian process:

> The nature of the hot... and cold (substance) thus cryptically produced appears from what follows: they are flame and air-mist (the inner part of which is assumed to have condensed into earth). The ball of flame fits closely round the air, as closely as bark grows round a tree... earth condenses at the core, flame fits closely round the air. Now the ball of flame bursts, breaks up into circles which are enclosed by mist which has also expanded, and forms the heavenly bodies. (Kirk and Raven, ibid., p. 133)

Speculations like this are generated from intuition within the functional perspective; patterns that are derived from past observations of the working of nature are applied to form a possible scenario of the cosmogonic process -- especially applied to the "elements".

Once we understand that the ancient people dwelled in the functional perspective rather than in the structural perspective of the scientifically oriented people of today, we can easily see why air, water, fire and earth would have been singled out across all ancient cultures, with minor variations, to be the elements, i.e. the fundamental constituents of the cosmos. Air, water, fire, and earth really correspond to the physical states of matter, i.e. gas, liquid, solid, and (roughly) plasma. As we know from basic chemistry, these states of matter are the surface effects of the underlying atomic or molecular kinetics of the actual constituents of matter: when the constituent of matter contains low (kinetic) energy (as reflected in its low temperature) the atoms or molecules of this constituent stick close together due to mutual attraction, at most vibrating at the same place, and this produces the solid state. When the temperature is raised and (kinetic) energy increased, the atoms or molecules, though still stuck close together, are excited enough to acquire kinetic energy to allow them to slide across each other, and this produces the liquid state. With more energy infused, the atoms or molecules acquire enough kinetic energy to overcome their mutual attraction altogether and start flying around in random directions, and this is the gaseous state. The constituent can be any of those in the periodic table, which is the "real" elements, and on the structural level. Ancient people did not know this structure, the periodic table with the kinetic energy necessarily associated with the elements in actual existence (since only under the condition of absolute zero degree can atoms not have any kinetic energy at all, and the condition of absolute zero is non-existent in practice); thus they took the surface effects of the elements with more or less kinetic movements to be independently existing, rather than as impressions produced by some structures underneath. Since these effects are really physical states of which any matter can transit from one into another according the energy level within it as reflected by its temperature, it is natural, when the ancient people attempted to differentiate a common essence out of all things existent, for them to see that everything was either solid as earth, liquid as water, gaseous as air, or "plasmic" as fire (in the analogical sense)[2], and to take these as elements (*stoicheion*), i.e. the fundamental constituents of everything. We need to remember that since the ancient knew not oxygen, hydrogen, helium, nitrogen, etc., when they spoke of "air" or "water" they meant simply

"gas" and "liquid" rather than a particular volume of oxygen and nitrogen in gaseous state or hydrogen and oxygen in liquid state. Hydrogen in liquid state or vaporized water would be taken just as much as "water" and "air" as the actual H_2O or atmospheric air. Furthermore, air, water, earth and fire had this special quality of indefinite shape and indivisibleness with respect to volume (any division seems arbitrary) which reminded the ancient of the substratum, the *arche*, arrived at through the memory of the first law of thermodynamics. Thus while Anaximander, staying pure to the memory, resisted identification of the substratum with any of the elements, other Presocratics would see in any of them the substratum sought for.

There is little need to debate about the detailed meanings of the Presocratic speculations about nature; because of the provincialness of consciousness at this stage (neither seeing far into the universe nor seeing deep into the atoms) the speculations about nature it generates based on extrapolation within the common-sense of its functional perspective are bound to appear absurd to consciousness of the scientific age that has shed its provinciality. What we need to focus on here is that this sort of metaphysics of being marks the budding of the empiricistically speculative understanding of the cosmos that was being differentiated by the pre-Socratics out of the mythic milieu.

Let's look at more of the Anaximandrian speculation about nature:

> ... the earth is cylindrical in shape... its depth is a third of its width... Its shape is curved, round, similar to the drum of a column... (Ibid., p. 134)
>
> The heavenly bodies come into being as a circle of fire separated off from the fire in the world, and enclosed by air. There are breathing-holes, certain pipe-like passages, at which the heavenly bodies show themselves; accordingly eclipses occur when the breathing-holes are blocked up. The moon is seen now waxing, now waning according to the blocking or opening of the channels. The circle of the sun is 27 times the size of the earth, that of the moon 18 times; the sun is highest, and the circles of the fixed stars are lowest. (Ibid., p. 135)

Again, the important thing to notice here is that the drive toward an empiricistic understanding of the structure of the cosmos has disengaged from the milieu of mythic animism. Furthermore:

> Winds (*anemous*) occur when the finest vapours of the air are separated off and when they are set in motion by congregation; rain occurs from the exhalation that issues upwards from the things beneath the sun... (Hippolytus *Ref.* I, 6, 7)
>
> (On thunder, lightning, thunderbolts, whirlwinds and typhoons.) Anaximander says that all these things occur as a result of wind (*pneumatos*): for whenever it is shut up in a thick cloud and then burts out forcibly, through its fineness and lightness, then the bursting makes the noise, while the rift (*diastole*) against the blackness of the cloud makes the flash. (Aetius III, 3, 1-2)

We see in these natural explanations the de-personalization of nature as compared with myth. Here the cosmos is becoming transparent in its structure, and mechanistic; the cosmos is no longer a field of interpersonal relationships.

Differentiation of consciousness is the cause of this de-personalization of the cosmos. Normally people would give the psychological explanation for this ("the Universe revolves around me"), that non-differentiation between the self and the external world would cause one to overflow the cosmos

with one's own emotions, fears, etc., recasting natural phenomena as the correspondingly responsive emotional states of ancestors or gods who are themselves the products of this non-differentiation. Differentiation between the self and the world would then cause one to see the cosmos as working in its own right, in its independence, and this third-person observation of this working (instead of second-person participation) would reveal the mechanical nature of the cosmos. On the other hand our thermodynamic genealogy has derived the continuation of the soul after death (the foundation of mythic consciousness) from the application of the conservational principle to functional entities (effects) such as consciousness, and then gods and ancestral spirits from the phenomenological sight of death and the application of "ancestor-permanence", and finally it led us to the saturation of the cosmos by the spirits. It was thus that the cosmos is structured as a field of interpersonal relationships among these gods or between gods and humans, natural phenomena being recast as reflections of these relationships. What happens now is that the philosophic mind has advanced further in differentiation from the mythic mind and no longer just applies the conservational principle to individual things like the consciousness of this and that ancestor, but has definitively realized that it is the underlying material common to all things that is eternally conserved, and that these individual things like "souls" (into which consciousness together with metabolism were objectified) themselves dissolve into the underlying Stream and are conserved only in that sense, i.e. as part of that, without retaining its individuality (its individual function) at all. The underlying material, the Stream, is thus de-personalized from these former "souls". This realization is the general achievement of the Presocratic Ionian "physicists", and thus they want to know what this underlying Stream is (water? fire? air?... or just the nameless apeiron?). (Of course, as said, today this Stream is identified as "energy".) And when the philosophic mind differentiates in this Total Stream the underlying patterns of its movements (the natural phenomena) from their specific instances, regularity in these patterns appears, conveying further a mechanical nature that is independent of any personal experiential dynamics and interpersonal relationships. Mechanical explanations of the working of nature in terms of intraworldly entities (air movement, water vapor and all that) and the mechanical, causal interactions between them thus take off. But given that it is still the functional perspective that is applying the first law, the consciousness in this perspective would still posit retributive process on the surface of the working of the cosmos ("beings give to each other recompense for their injustice...") save that the process is becoming mechanical and impersonal (without the angry gods judging you in the world of the dead before your reincarnation). The revelation of the mechanical nature of the cosmos, on the other hand, does not mean that divinity is purged from it as well, but the divinity is increasingly transcendent, principled, unified, and impersonal. In the final analysis we must remark however that this empiricistic understanding is still not science yet, because the speculation is conducted in functional perspective; it explains the genesis of functional entities (wind, lightning, typhoons, even stars) by reference to other functional entities (air or wind) because as yet the provincial consciousness has no knowledge of the structures beneath the functions (effects) such as molecular mobility, chemical or atomic changes.

Here is what Anaximander says of anthropogony.

> Anaximander... conceived that there arose from heated water and earth either fish or creatures very like fish; in these human grew, in the form of embryos retained within until puberty; then at last the fish-like creatures burst and men and women who were already able to nourish themselves stepped forth. (Censorinous *de die nat.* 4, 7 in ibid., p. 141)
>
> ... having become adequate to look after themselves, they came forth and took to the land. (Plutarch *Symp.* VIII, 730 E in ibid.)

This piece smacks of Sumerian or Syrian origin. If so, then it was purged of the mythic totemic elements ("humans are descended from fish") to become speculative; but it must have been "reasonable" enough for Anaximander to adopt it as speculative. Hence we tentatively suggest that the reasoning here may have been based on the impression that water is nourishing (e.g. for fetus and for fishes) in a way that air is not. And water, just like air, has that special expansive formlessness within which individual beings may condense and which is thus reminiscent of the primordial undifferentiated whole which is itself reminiscent of Conservation. If the suggestion is tenable, then here the Anaximandrian convergence with evolutionary biology is another case where common sense, in which the structure of reality is dimly manifest, leads to impressions approximating the truth. (Evolution: life evolved in sea and possibly near heat source, for chemo-autocatalytic closure is more easily formed in such environment of plentiful nutrient and higher energy gradation; vertebrate land animals evolved from fishes that went on land.) Furthermore, Anaximander reasoned that "the first living creatures are generated from slime... by the heat of the sun". (Ibid., p. 142) A common-sense, empirical, non-mythic, mechanical worldview that has de-personalized the cosmos.

Accompanying the new mechanical (de-personalized) worldview in the process of the differentiation of consciousness that is evident among the Presocratic physicists is mathematical (specifically geometric) rationalism. Greek mathematics (specifically geometry) began with the Presocratic φυσιολογια (discourse on nature, on *physis*) and both Thales and Anaximander were famous for their achievement in geometry. Anaximander's status as a great mathematician (or geometer) led to a "rational" construction of the cosmos that, again, would offend contemporary scientists.

> The world of Anaximander "is built up in strict mathematical proportion"; it is "essentially geometrical". The construction of the world obeys mathematical logic: the earth must remain floating in the center, because it is in all directions equally distant from the stars. In the description of the size and distance of stars, with which geometry expands onto the Universe, is included all the determinate knowledge about the geometric proportion of distance, real and seeming size. (Walter Burkert, *Weisheit und Wissenschaft*, p. 395).[3]

A "rational" construction of the cosmos means that preconceptions about geometric beauty -- symmetric geometric proportion -- should take precedence over observation in such construction. Contemporary scientists would condemn such approach -- and attribute the errors of the system to this priority of "logic" over observation -- because, they suppose, accuracy in construction demands the precedence of observation instead. This is not true: contemporary science is replete with examples where preconception about mathematical "elegance" leads to the construction of the cosmic structure which is subsequently verified by observation. (For example, the Yang-Mills quark model.) The errors in Anaximander's system is due, really, and again, to the provincialness of his perspective. Finally, we need to note that Anaximander's "rational" approach constitutes the precursor of the project of Platonic forms: the empirical (synthetic) world should be the materialization of the a priori (analytic) geometric forms.

4. Concluding the Presocratic Ionian way

The Presocratic Ionian "physicists" do not yet constitute a salvational movement; but (compared with myths) their more advanced, philosophical comprehension of the problem of the origin -- their beginning philosophical anamnesis of Conservation -- is to lay the foundation for the second mode of salvation that is about to emerge in Hellas beginning with the Pythagoreans and Parmenides and which consists in salvation through the intellectual vision of the "origin". As we have already hinted

at, the memory of the first law is what is responsible for the strange coincidence between the images of the functional perspective (whether in myth, philosophy, or religious mysticism) and the structure of the Universe revealed by empirical sciences. If the Presocratics' *arche* as substratum/ underlying/ under-remaining (*hupomenos*) and that of many other philosophers to come is reminiscent of the grand unified field or the hot-soup of Big Bang of modern theoretical physics, then the initial differentiation of the primordial formlessness into the definite component forms of the cosmos which we see so often in the creation myths or in philosophic systems such as the Yijing metaphysics' structure of the cosmos during the Sung Dynasty in China, is reminiscent of the immediate afterwards of the Big-Bang, the same undifferentiated energy field from which subatomic particles gradually condensed into stabilized forms in order to later re-combine and form the beginning elements (hydrogen and helium) of the periodic table. There is no need to attribute any particular ingenuity to the ancient mythopoetic or philosophic peoples in diverse cultures; given the intuition of the law of Conservation it is hard to imagine any other way to derive all the things in the world except through differentiation from a primordial, undifferentiated mass that has been there forever. But the question remains for the up-coming transcendentalists to solve: where did this primordial mass itself come from?

5. A reminder

We have emphasized throughout that contemporary philosophy in the West has completely veered off course from the ancient: it is no longer concerned with thinking about the "infinite" -- which has to do with the first law -- and certainly not with any salvation of the person: the propositional destruction of philosophy by analytic philosophy in the English-speaking world aside, in Europe, with the so-called "Continental philosophy", philosophers might still talk about Being", etc., but that no longer has much to do with the conservation of the materiality of things, but only with the intelligibility of things -- insofar as they have been heavily influenced by Martin Heidegger. Heidegger, starting with his *Being and Time*, is producing the modern version of Plato's theory of forms, explaining the showing of things, and has a different concern than that of the Presocratic Ionians (who want to know about the material origin of things). His re-interpretation of the Presocratics in general (such as in *Die Metaphysik als Geschichte des Seins*) and of Anaximander in particular (such as in *Grundbegriffe, Gesamtausgabe*, 51) in terms of the "presence" and "showing" of Being is therefore completely wrong and must be discarded.

Modern (Western) philosophy's derailment is due to the rising influence of positivism just before and during the Enlightenment, when the natural human intuition of conservation was temporarily lost. "Atomism" was on the rise: The Enlightenment scientists believed that the universe was composed of, on the one side, elemental chunks *which were irreducible and with immutable properties*, and, on the other, in-material forces. With those immutable elemental chunks, matter was no longer taken to be malleable, so that "things" (the "objects" we see around us) were no longer taken to be capable of blending back into their Source (e.g. the apeiron) upon their destruction. When conservation was recognized, the conservation of matter was thought to be independent of the conservation of energy. This is why the positivist scientists and the philosophers of this age and since then have had such a difficult time understanding, not just traditional, classical philosophy, but also the primitive religions before that. In effect, they no longer understand Conservation. After the modern scientific discovery that matter and energy are interchangeable -- when Einstein proudly announces that "through the theory of relativity the two fundamental laws [conservation of mass and conservation of energy] were melted into a single law": the conservation of matter-energy[4] -- the intuition of conservation such as leads to spirituality in the past is finally beginning to be recovered, as seen in the new age movement when the new-agers say: **"energy is the source of all"** or **"we are all made of and came from that**

energy, to which we return upon death". Matter is becoming malleable again; we are at last coming back to the Presocratics. However, those scientists who have recovered from positivism and come to see conservation-spirituality as well, though only in a confused fashion, such as Fritjof Capra, usually erroneously treat this "recovery" as some extraordinary "discovery", due to the destruction and forgetfulness of the spiritual traditions in the past by academia. For example, these scientists often say: "Since the beginning of time people thought that the universe was composed of matter on one side and forces/ energy on the other. But Einstein's relativity has shown this to be wrong..." They don't know what they are talking about. The appearing and blending-back of matter from and into the common formless substratum as its source ("energy") is understood since the beginning of human consciousness, from tribal, intraworld religions through the philosophies of the Axial time, and is only temporarily lost during the age of positivism.

Let's say it again. The proper object of ancient philosophy from East to West has been "Being", which refers to the undifferentiated substratum of which all things are made, and which is the ancient way of referring to the "energy" of modern sciences. It is argued here that the notion of this "Being" came from an ancient, qualitative but not quantitative, as yet immature intuition of the first law of thermodynamics, the law of Conservation. Insofar as spirituality comes from the experience of the self and other individualities being only partialities of and participation in a total, all-encompassing whole ("Being"), spiritual experiences are thus also founded on the intuition of the first law. During the rise of positivism which characterizes the immature phase of science from 1500 to 1950, this spirituality based on the first law was temporarily forgotten by the West, but it is now regained in many of the spiritual movements such as the New Age.

Footnotes:

1. So this passage of Anaximander's in its entirety is: εξ ων δε η γενεσις εστι τοις ουσι, και την φθοραν εις ταυτα γινεσθαι κατα το χρεων. διδοναι γαρ αυτα δικην και τισιν αλληλοις της αδικιας κατα την του χρονου ταξιν. "That from which genesis of beings came and into which their destruction happens according to necessity. For they give to each other justice/judgment and recompense for their [respective] injustice according to the order of time." This line Heidegger claims to be "das anfängliche Sagen des Seins im Spruch des Anaximander" ("the beginning articulation of Being in the dictum of Anaximander") and he accordingly accords it a fundamental status as the first articulation of Being in Western consciousness: "Aus dem ersten Anfang des abendländischen Denkens ist uns ein Spruch überliefert... Der Spruch gehört dem griechischen Denker Anaximander, der ungefähr zwischen 610 bis 540 lebte." ("From the first beginning of Western thinking a dictum [the above quoted line from Anaximander] has been passed down to us... The dictum belongs to the Greek thinker Anaximander, who approximately lived between 610 and 540 B.C." *Grundbegriffe, Gesamtausgabe*, 51; p. 94) We certainly agree with him here at this point, the fundamental status of this line. The inadequacy of Heidegger's metaphysical reading of past philosophers will be noted throughout.

2. Fire is in fact not plasma, which is ionized gas, nucleus stripped of electrons; it is the effect of rapid oxidation, the (electromagnetic) energy released as photons when the electrons are snatched away by oxygen.

3. "Die Welt des Anaximandros 'baut sich in streng mathematischen Proportionen auf', ist 'in ihrem Wesen geometrisch'. Der Weltenbau gehorcht der mathematischen Logik: die Erde muß im Zentrum schweben bleiben, weil sie in jeder Richtung gleich weit von den Gestirn-'Rädern' entfernt ist. In den Angaben über Größe und Abstand der Sterne, mit denen sich die Geometrie aufs Universum ausweitet, sind ganz bestimmte Erkenntnisse über geometrische Proportionen von Entfernung, wahrer und scheinbarer Größe enthalten." The quoted material is from Jaeger and Heidel.

4. "Durch die Relativitätstheorie werden sie zu einem Satze verschmolzen." *Ueber die spezielle und allgemeine Relativitätstheorie: gemeinverständlich*, p. 31.

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