NOTHINGNESS

NOTHINGNESS

BOOKS

CHINESE PHILOSOPHY
Wing-Tsit Chan, Princeton U.P. 4th printing 1973

TO INFINITY AND BEYOND: A CULTURAL HISTORY OF THE INFINITE
Eli Maor, Princeton U.P. 1991

MASTER OF WISDOM: THE WRITINGS OF BUDDHIST MASTER NARGARJUNA
Tr. C. Lindtner, Dharma Publishing, 1997

IMPOSSIBILITY: THE LIMITS OF SCIENCE AND THE SCIENCE OF LIMITS
John Barrow, Oxford 1998

THE KINGDOM OF INFINITE NUMBER: A FIELD GUIDE
Bryan Bunch, Freeman, 1999

NOTHINGNESS: THE SCIENCE OF EMPTY SPACE
Henning Genz, Perseus Books, 1999

THE NOTHING THAT IS: A NATURAL HISTORY OF ZERO
Robert Kaplan, Oxford, 1999

THE MYSTERY OF ALEPH:
MATHEMATICS, KABBALAH, AND THE SEARCH FOR INFINITY
Amir D. Aczel, Four Walls Eight Windows, 2000

ZERO: THE BIOGRAPHY OF A DANGEROUS IDEA
Charles Seife, Viking, 2000

THE HOLE IN THE UNIVERSE:
HOW SCIENTISTS PEERED OVER THE EDGE OF EMPTINESS
AND FOUND EVERYTHING
K.C. Cole, Harcourt, 2001

97#79

ALAPAN00.WP6 November 6, 1997

THE WHOLE WORLDVIEW CATALOG

ALTERNATIVES-APOPHASIS-ANONYMITY

CANDIDATE TOPICS:

1. ALTERNATIVES:
   - Los Angeles
   - Fritz Zwicky
   - Real Wealth

2. AMERICA: UNRESOLVED ISSUES
   - What sort of melting pot
   - Church and State
   - First Amendment

→ 3. APOPHASIS: VIA NEGATIVA
   - Induction and Falsification
   - Balance and Inversion
   - Beyond the Law of Excluded Middle
   - SYMMETRY

→ 4. ATHROISMATICS: PARTS AND WHOLES
   - Repetition, Iteration, Regression, Recursion
   - Reversibility and Irreversibility
   - Nodes, Links, Traffic, Messaging, CARGO

5. BRAINWASHING: CONTROL AND MANIPULATION
   - Conspiracies, Cover ups, Diversions

6. COSMOGONY: $G, c, \hbar$ and α, μ, S
   - Schwarzschild and Heisenberg Limits
   - CHON

7. DIALECTICS: PRINCIPLES AND FORCES
   - Departure and Return, Chamberlain and Moulton
   - Diversification and Homogenization
   - Private and Public
   - Change and Permanence, Herakleidos and Parmenides
   - SAT and Repetition
   - Plato and Protagoras

→ 8. EPISTEMOLOGY: <---> ONTOLOGY
   - Templatonics: Archetypes and Templates
   - Intellect and Non-intellect epistemologies

9. INFORMATION: THOUGHTS WITHOUT A THINKER
   - Degree of Surprise-- Shannon
   - Negentropy-- Szilard
   - Bits and Bytes--
   - Useful Data-- F(t,x,y,z,person)
   - Minimum Length of Description

10. NUMBERS: PYTHAGORAS AND PLANCK
   - Discrete and Continuous, Digital and Analog
   - The Species of Dyads, Triads, Quadrads,...
   - Quadric Diagrams and Fourness
   - Prime Numbers and Fibonacci Numbers
   - Rationals, Radicals, Transcendentals
   - Fulcrums, Prodsums

11. PYRAMIDS: STONE AND SYMBOL
   - Pi and Phi
   - Rorschach and Typology

12. SIGNIFICATION:
   - Pleasure/Pain Physical
   - Desire/Aversion Physio-psychological
   - Interesting/Boring Psychological
   - Important/Irrelevant Societal
   - Valid/Invalid Spatio-Temporal
   - TRUE/ Cosmic

13. SPACE AND TIME: TEMENOS AND KAIROS
   - Duration and Interval
   - TDMC
   - The Six Physical Definitions of Time
   - Motion Time vs. Density Time
   - Kairos: Journey of the Year
   - Space: Extension and Separation
   - Space: Dimension and Curvature
   - ADMC

14. NOISE AND SUNYATA
   - Vairacona and Akshobya
   - White, Pink, and Brown Noise
   - The Central Limit Theorem
   - Modulation: White Noise ---> Gausian

97#81

ALAPAN01.WP6 November 7, 1997

ALTERNATIVES--APOPHASIS--ANONYMITY

ALTERNATIVES:

The real measure of a person's wealth is in the number of alternatives to which he or she has access.

The motorists of Los Angeles have been well trained in understanding the value of access to alternatives. Almost every week there are radio advisories telling drivers in some part of the city to take alternate routes. L.A. drivers have learned to keep a collection of alternative routes always handy. If, as is often claimed, that what goes on in Los Angeles is the wave of the future for other cities, then the age of appreciation of alternatives is soon to be upon us.

A pioneering recognition of the value of alternatives was made during WWII by the astrophysicist Fritz Zwicky at the California Institute of Technology. Zwicky developed a method which he called morphological analysis that allowed him to realize several alternate solutions to a problem. Using this method he invented a plethora of jet engines, including ram jets, pulse jets, ... independently coming up with the German V1 and V2 weapon systems. Zwicky felt that too long humans had not only been content with a single solution but had fallen into being dogmatic about that single solution, persecuting those who proposed alternatives. The time had come to change this and welcome all possible alternatives as providing a rich smorgasbord from which we could choose the best solution for the situation at hand. It is this philosophy that causes us to include ALTERNATIVES in our mantra for the 21st century.

also want certainty

Perhaps one reason that humans have been content with preferring the single solution to multiple solutions is that they consider redundancy to be inefficient. (Also decisions are a nuisance to be avoided whenever possible). But if nature goes heavily into redundancy there must be some wisdom involved that we are ignoring in our pursuit of efficiency. In the long term redundancy may prove to be of far more importance than efficiency: Important for survival, important for innovation and important for emergence. Since actualization exhausts potential, something is required from time to time to replenish potential. We may speculate that it is variety itself that fuels potential and it is depletion of variety that removes potential.

Dogma, Party-line

Pertaining to this, Stephen Jay Gould has shown that what bio-evolution is really about is not the development of complexity, of more complex organisms, but the increase of a greater variety of organisms. That is, evolution is in the business of increasing alternatives, and hence overall potential.

97#85

ALAPAN02.WP6 November 29, 1997

ALTERNATIVES--APOPHASIS--ANONYMITY

APOPHASIS: VIA NEGATIVA

> *What keeps me alive is what is found between the images, between the words, between the thoughts. In the emptiness of thought, the emptiness of feeling, the emptiness of the body arises the fullness of life.*
>
> --Basarab Nicolescu, Théorèmes poétiques

In the beginning God created the heaven and the earth. And the earth was without form and void. ---Genesis 1:1,2

Form is emptiness and emptiness is form.
---Buddhist

Matter is one mode of existence, energy is another;
Form is one mode of no-existence, void is another.

We have chosen to limit the world to that which exists and ignore that which no-exists or inversely exists, confusing inverse existence with non-existence.

Existence can be defined by what is, inverse existence by what is not.

There are many levels in the void just as there are in matter/energy. Levels in matter/energy are separated by gaps of void, levels in void are separated by gaps of matter/energy.

Apophasis deals with both negation (-x) and inversion (1/x). In negation emptiness (zero) is the fulcrum, in inversion unity (one) is the fulcrum. There is the nothingness of zero and the nothingness of one. [cf "Uniform sameness is indistinguishable from non-existence--Eddington.]

The continuous (analog) cannot work with void,
only the discrete (digital) can work with void.

There can be no verification, only falsification.
---Karl Popper

Science must replace induction (Bacon)
with falsification (Popper)

Music is not only the notes, but is also the silence between the notes.

There are places in this world that are neither here nor there,
neither up nor down, neither real nor imaginary
These are the in-between places, difficult to find and
even more challenging to sustain.
– Thomas Moore

Western Logic is based on the properties. [P-SPACE, 10 QUADRANT]
A material thing cannot be two places at one time,
Two material things cannot be at the same place at one time

Nothing is that which is invariant under the
transformation: earlier to later.

What would be an apostatic definition of nothingness?

Omnibus ex nihil ducendis sufficit unum
– Leibniz
For making everything from nothing
one method suffices

89

97#89

NONEXIST.WP6 December 10, 1997

also 98#24

ON NON-EXISTENCE AND EXISTENCE

Uniform sameness is indistinguishable from non-existence.
--Sir Arthur Stanley Eddington

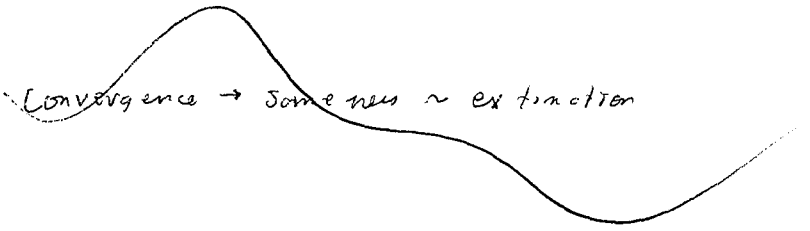
There are two kinds of non-existence:

- The kind represented by the symbol "0", zero. Zero non-existence is nothingness, emptiness, the void

- The kind represented by the symbol "1", unity. Unity non-existence is uniform sameness, absence of alternatives, no variety, all entities occupying the same point in multi-dimensionsal Hamming Space.

We ordinarily have little difficulty identifying non-existence with nothingness. If it doesn't exist, it is not there, it is nil. However, it took humans thousands of years before they came up with a symbol for nothing and nothingness. The Hindus and the Mayans both (and I presume, independently) came up with such a symbol within the last 1500 years. But with the unity type of non-existence it is not so easy. We have great difficulty equating a non-existence with "1". After thinking about it, we might go along part way and say, "O.K. if you would substitute awareness for non-existence, I can see where you are coming from. We are aware of things through their differences, so if no difference, then no awarenes, but saying that non-awareness and non-existence are the same thing is a bit much." That is a good point: the question of the relation between the set of things that exist and the set we are aware of and the set we could be aware of, a question that needs further exploration, but for now let us say that there are two kinds of non-existence: The first type really doesn't exist, and the second type might exist but as far as we are concerned it doesn't exist. The difference between these two types might boil down to the limitations of our sensory apparatus, or to the limitations of our intellectual apparatus. [We might here note, moving up a level, that the unity type of non-existence tells us that there cannot even be non-existence unless there are at least two types of non-existence.]

We thus see that existence [read awareness if you will] requires alternatives, variety, differences. When there is but one color, there is no color, when there is but one odor, there is no odor, were there but one tone, there would be no sound. Senses arise in response to differences. When all that exists shrinks down to total uniformity, total homogenization, then extinction ensues. Perhaps this is why bio-evolution is so concerned with the production of variety. It has been said that alternatives are wealth. It might be said that alternatives, diversity, variety, are not only our wealth, but the root of our existence. So as they say in Paris, "Viva la difference".


Convergence → Sameness ~ extinction

OUT OF NON-EXISTENCE, EXISTENCE WAS BORN

We start with two kinds of non-existence, the "0" kind and the "1" kind. From each of these an existence was born.

First there is existence born out of "0":
0 --> x and -x (e.g. matter and anti-matter)?

Second there is existence born out of "1":
1 --> x and 1/x $x^{-1} \leftarrow 1 \rightarrow x'$

[Question: Are there two Sunyatas or only one? Does Vairacona create type "0" existence, and Aksobya create type "1" existence, or vice versa, or do they both have a role in both types?}

Note that we end with a triad. The material world may be represented by the set of {x's} which is common to both the "0" and "1" creations, but this set of {x's} which we take as constituting the physical world, has two distinct origins. Behind the shared world of {x's} lie two infrastructures, the {-x's} and the {1/x's}. Could this be why there is Ahura Mazda and Ahriman? Why there is God and Satan, why there is good and evil? There were two creators! How are they to be reconciled? Is that our task?

Or is there but one creation, that out of "0", and one destiny, that of "1" (which is extinction)? Then "0" is the Alpha and "1" is the Omega.

It is of interest here that there are also two distinct religious pursuits. Those seeking emptiness, seeking the "0", the infra-structure of their origin (?) These are Buddhists, Taoists, Sufis, Christian and Kabalistic mystics. And there are those seeking oneness, community, "may we be one", These are most Muslims, most Church Christians, and Israelis. The oneness they seek is the unity of their tribes, or their dominance over all humanity.

The "0" path is the path to individuation, diversity, the richness of variety. The "1" path is the path of uniformization, homogenization, and extinction. These two principles, the "0" and the "1" constitute the basic dialectic that operates throughout the cosmos at all levels.

further

$e^x \leftarrow x \rightarrow \ln x$

$x^n \leftarrow x \rightarrow \sqrt[n]{x}$ a second number appears, n

DIALECTICS IN ALTERNATE SPACES

We recognize two kinds of dialectic:

The first type of dialectic consists of a dyad whose two components act simultaneously. The counter action of these opposing components continues until a state of equilibrium is reached.

In the second type of dialectic only one component acts at a time. The alternate action of the components results in growth, evolution, or emergence.

We tentatively postulate four spaces:

P-SPACE, the space of nodal positions; H-SPACE, the space of nodal forms and patterns, (information content of nodes); B-SPACE, the space of nodal interaction, internodal forces, traffic, and messages; S-SPACE, the space of selection, decision, choice.

The attraction/repulsion dialectic takes a different form in each space as in TABLE I.

SPACE\DIALECTIC	ATTRACTION/REPULSION	
P-SPACE	CONTRACTION/EXPANSION	Position
H-SPACE	HOMOGENIZATION/DIVERSIFICATION	Pattern
B-SPACE	CONSOLIDATION/FRAGMENTATION	Bonding
S-SPACE	SELECTION/OPTION	Selecting

TABLE I

In addition to **intra** linking within a space, there must be **inter** linking between spaces. The dialectic itself is one form of interspatial link.

P-SPACE:

Position or physical space, the space in which our sensory apparatus operates. This space can be viewed either as a three dimensional geometric space or as four dimensional space-time. Its properties are the basis of Aristotelian two valued logic and the law of the excluded middle. It is characterized by here and not here and now and not now. No two objects can occupy the same coordinates (place) at the same time and no single object can be at different places at the same time. [This is sort of a generalized Pauli exclusion principle]. These interconnections of space and time coordinates indicate that the space and time axes are not orthogonal in the sense of being completely independent,

contrary to their usual mathematical formulation. There are two kinds of distance in P-SPACE: extension in zones of non-zero density and separation in zones of zero density. Localization in P-SPACE means an object has a unique set of space-time coordinates. Non-localization means that an object occupies an extended space-time volume.

H-SPACE:
Hamming or morphological space, the space of archetypes, blueprints, templates, and recipes. This is a multidimensional space, having as many dimensions as the number of parameters required to describe a form or pattern. Distance between two objects in H-SPACE is a measure of their difference in form. Identical objects will have the same coordinates in H-SPACE. Unlike in P-SPACE, there is no limit to the number of objects that can have the same coordinates. The volume occupied by a set of points in H-SPACE is a measure of their variety. The smaller the volume, the more homogeneous the set. Whereas in P-SPACE a volume represents non-localization of a node or entity, in H-SPACE there is no corresponding interpretation of volume for a single entity. [Unless that entity is Proteus himself].

B-SPACE:
Bonding or control space, the space whose coordinates measure the degree and nature of the interaction between nodes or entities. Distance in B-SPACE is a measure of the degree of bonding between nodes or entities. The smaller the distances the stronger the forces of attraction and the more intimate the bonding. Depending on the number of points and their density, volumes occupied by a set of points in B-SPACE, from smaller to larger, will represent organisms, societies, institutions, or ecologies. Density is a measure of dependence. Increasing density signifies increasing interdependence, decreasing density signifies increasing independence. Also B-SPACE includes the nature of the communication channels between nodes. A channel may be broad band or narrow band, may range from laser or pencil like to omnidirectional or 4π like. Small volumes indicate narrow bands and beams, large volumes the opposite.

S-SPACE
Decision or selection space. Volume in S-SPACE is a measure of the number of options or alternatives that are available. Decision processes reduce the volume. A second feature of S-SPACE is the mode of selection: Random, deterministic (causalistic), teleological (finalistic), or contextual.

PYPLAPAN.WP6 APRIL 19, 1998

AN ALTERNATE ONTOLOGICAL VIEW
THE PYTHAGORAS-PLATO-PAULI MODEL

1) Along with Pythagoras, we postulate that there must be at least two of anything in order for that thing to exist.

2) Along with Plato, since by 1) there must be at least two spaces, we postulate that in addition to the every day physical and position space, P-SPACE, in which our senses are imbedded, there is a second space whose dimensions and coordinates determine the form and pattern of things. This second space we shall call H-SPACE.

3) Along with Pauli, we postulate a General Exclusion Principle that maintains no two entities in the universe can have the same coordinates in all spaces. This means that there must be at least one space in which any two entities must have different coordinates. The inference of this principle is that every entity in the universe is unique.

There is a basic contradiction between Pythagoras' 'more than one to exist' and Pauli's general exclusion principle which says every thing in the universe is unique. This can only be resolved if we assume that Pythagoras requires a like pair in every SPACE. Pythagorean non-existence would state that unless there are two or more identical entities, E(1), in a SPACE S, E(1) does not exist in SPACE S. Pauli requires that if there are two or more identical entities in space S, then these entities must differ in some other space.

4) Along with Noether, we postulate a General Conservation Principle that preserves basic symmetries and equilibra within and between all SPACES.

The operation of the General Exclusion Principle is ubiquitously displayed in P-SPACE by the fact that two objects cannot occupy the same place at the same time, that is, cannot have the same space-time coordinates. This fact allows more than one entity to have the same coordinates in H-SPACE. Were it not for this, there could not be a multiplicity of entities with the same form.[1]

---

[1]If the converse were true, P-SPACE and H-SPACE properties being interchanged, then no two objects could have the same form at the same time, but many objects of different form could simultaneously occupy the same place in P-SPACE.

There is nothing in the foregoing three postulates that forbids the existence of more than two spaces. Another space that seems needed in order to fully explain the phenomenal universe is a space whose coordinates indicate the strength of the bonds or forces acting between entities. We shall here designate this SPACE as B-SPACE.

Consider an example: Competition between organisms increases with the degree of similarity between the organisms. The more alike they are the more competitive, that is, the higher the density in H-SPACE the greater the repelling force in B-SPACE. Contraction in H-SPACE leads to expansion or fragmentation in B-SPACE.

These examples show that there are relations between the internal happenings and conditions in one SPACE and what happens or is possible in another SPACE.

$$E^{R}_{n_1 \ldots n_k}(i \ldots t)$$

24a
98#24

SOMENOTH.WP6 APRIL 22, 1998

Also 97#89
97#85
98#32

SOMETHING OUT OF NOTHING

Omnibus ex nihil ducendis sufficit unum[1]
---Leibniz

A classical philosophical and theological question centers around the creation of something out of nothing. How could God create something from nothing? And where did God come from? From non-existence into existence or did God exist eternally? In a more modern idiom, where did all the matter and energy in the Big Bang come from? And what was going on before the Big Bang? These puzzling questions are basically tied to our concepts of existence and nothingness. We could perform a thought experiment: remove one thing at a time from all that exists. When everything has been removed from existence to non-existence, then what is left we define as "nothing". [cf. the Guru* who demonstrated this process with the Maharaja's chariot.] The question morphs to: What is the relation of nothingness to non-existence? or Does nothingness exist?

It is curious that in discussing nothingness and non-existence, we are entering a domain that has been largely avoided by Western thinkers. We have studied the rules and relations that govern things that exist, and tossed aside as meaningless questions about nothingness and non-existence. But from time to time even in the West philosophers as well as mystics have ventured apophatically into this realm.

A recent scientist and philosopher who thought about this subject was Arthur Eddington. He concluded: "Uniform sameness is philosophically equivalent to non-existence". Eddington's equation reads, "sameness = non-existence", but this does imply that "nothing = non-existence". So for Eddington the problem becomes not the creation of something out of nothing, but the creation of something out of sameness. Eddington's approach puts ontology not only into a new ball park, but into an "inverted ball park". He maps existence onto non-sameness and non-existence onto sameness. In other words there is an existence-sameness symmetry. Following Eddington, ontological questions will now have to do with the nature of sameness rather than with the nature of existence.

So what can we say about sameness? At first thought we would say that uniform sameness means no pattern whatsoever. No pattern? That is precisely what white noise is. Or how about a continuously repeating pattern like an unmodulated wave? Such may have a sinusoidal pattern, but in repeating over and over it becomes uniform sameness. Both white noise and continuous waves are candidates for Eddington type non-existence.

---

[1]For making everything from nothing one [method] suffices.

* Nagarjuna

Now Leibniz says we need only one approach to generate something out of nothing, and under the Eddington sameness = non-existence equation we already have two sub-approaches. However, in both the white noise and the uniform wave case, a single operation suffices to destroy sameness. This operation is **modulation.** In the first case, consistent with the central limit theorem, white noise modulated with white noise generates a gaussian or bell shaped distribution. Repeated iterations of this operation result in gaussians with decreasing dispersions. After a few iterations the result begins to look like a Dirac δ function. Hence repeated auto modulations of white noise lead to a very definite here and now pattern. The sameness has become non-sameness and non-existence has become existence.[2]

In ancient times there was another westerner who philosophised on non-existence. This was Pythagoras.

---

[2]The generation of various entities through the modulation of a continuous carrier wave having the planck frequency of 10^{43} hertz will be discussed in Part II.

98#27 27a
2a 1998#20
#14

PANOPLPY.WP6 APRIL 13, 1998 rev APRIL 28, 1998

THE PA-NO-PL-PY ONTOLOGICAL POSTULATES

In selecting basic principles of a very general nature from which the properties of phenomena can be derived, certain propositions taken from the works of Pythagoras, Plato, Noether, and Pauli, suggest themselves as possible candidates. The following four postulates are here taken as fundamental:

- 1) One does not exist. One of anything has no existence. Only when there are two or more instances of a thing does that thing acquire the attribute of existence.
  ---Pythagoras

- 2) In addition to the realm of physical material existence there is a second realm which contains the archetypes, templates, patterns, and programs that shape physical entities and processes.
  ---Plato

- 3) There is a general conservation principle governing all existence which emerges out of symmetry. For every entity that exists there is a balancing counter entity preserving symmetry.
  ---Noether

- 4) There is a general exclusion principle that requires that no two entities can be identical in every respect. This principle implies that every entity that exists is unique.
  ---Pauli

The first question is, do these postulates form a consistent set? Postulate 1) and postulate 4) appear to be contrdictory. Pythagoras requires that there be at least two examples of a thing before it can exist. Pauli requires that no two things be identical. This can be resolved by employing postulate 2), which holds that everything exists in at least two realms, the physical and the archetypal. Existence in two realms would supply the more-than-one requirement of Pythagoras but would also be in accord with Pauli in that the entity in physical space is not identical to that same entity in Plato's information space. This also could be said as follows: Pythagoras would say that unless there be both phenotype and genotype there is no existence. Pauli would say that phenotype and genotype are not identical.

A second way in which postulates 1) and 4) can be reconciled is to allow multiplicity of a thing in physical space endowing it with Pythagorean existence, but since things cannot occupy the same position in physical space, their space-time coordinates would differ, meaning they are not identical in every respect.

98#32

NONEXIST2.WP6 MAY 11, 1998

also 98#24
97#84
97#85

ON NOTHING AND NON-EXISTENCE

Over millennia human experience and language developed a large set of relations between things that exist, symbols and words for them, and logical sytems for organizing them. But the concepts of no-thing, non-existence, saw no need for symbols. Indeed it is paradoxixal to have a symbol for something that does not exist. What is meant by existence in this context is that which is perceivalbe by the senses, originally directly perceivable. However, awareness of existence moved beyond direct perception. It was enlarged through instrumental adjuncts to the senses, telescopes, microscopes, etc. through inferences from patterns of behavior and patterns of organization, and most abstractly through mathematical modeling. The word existence was maintained for the inputs from all these sources, but that may have been a huge epistemological mistake.

Kant made a distinction between the world whose existence is knowable through any available means: the phenomenal world, and that which is not available to us by any means of knowing but nevertheless exists: the noumenal world. A very important distinction but increasingly insufficient. With only one word for existence we are not able to construct valid ontologies by rational means.

An alternative available to us is an apophatic approach. To investigate along with the various species or levels of existence the levels or species of non-existence. One of the earliest to use this approach in the West was Pythagoras. Pythagoras concluded that **ONE** does not exist. If there is but one of anything that thing does not exist. If there is but one color, then color does not exist. If but one tone, sound does not exist, If but one universe, the universe does not exist, If but one God, God does not exist. If any parameter has but one value that parameter does not exist. Pythagoras recognized the need for a symbol for non-existence and found that the number ONE had that attribute.

Some twenty five centuries later the physicist Arthur S. Eddington wrote the second sentence to Pythagoras' thesis. Eddington maintained that "Uniform sameness is philosophically equivalent to non-existence". This is an extension of apophasis into the realm of perception. It can be argued that Eddington should have said, "Uniform sameness results in non-awareness". But is not uniform sameness the same as Pythagoras' ONE? If so then non-awareness is the human equivalent to non-existence. This brings again into focus the question of the relation between consciousness and existence, between epistemology and ontology.

In Pythagoras' day there was no symbol zero, "0". Had there been perhaps he would not have settled on ONE as a symbol for non-existence. The origin of zero is not certain. It apparently came from India and was passed by the Arabs to Europe around the seventh century. It was also independently invented by the Mayans or other peoples of meso-America, possibly about the same time as in India. The paradox of having a symbol that stood for nothing was finally penetrated. But is the nothing of zero the same as Pythagoras-Eddington's non-existence of ONE? Are nothing and non-existence the same?

Three possibilities occur:

- Non-existence ≡ Nothingness
- Nothing is but one form of non-existence
- The class of non-existing is a sub-class of the class of nothings.

The usual idea of null-set, or empty set is not implied here.

Of course $0 \neq 1$ contradicting the first premise.
Since $1 > 0$ the second premise is still in the running.
but it looks dim for the third premise. But this is predicated on the quantitative attributes of zero and ONE not on their Pythagorean attributes.

So tentatively we conclude:

"Nothing is but one form of Non-Existence"

and along with Pythagoras:

The whole does not exist only diverse parts exist.

To opposite of the conclusion of Nagarjuna

composites
All combinations are temporal
- Sakyamuni

Only the whole exists

GUP1.wpd **August 25, 1998**

The Second Law of Thermodynamics operates in two modes:

Mode I:
The Homogenization Mode.

Homogenization forces are those that tend to bring the range of values of a parameter to a single value. Gravity attempts to bring the positions of masses to a single point. The second law of thermodynamics attempts to bring temperature throughout the system to one value. Further, when a parameter contains only one value, then it ceases to be a parameter. Thus if homogenization succeeds in reducing all values to the same value it then effects the elimination of a parameter. If all parameters are eliminated, that is total sameness prevails, then extinctions results. Ultimate homogenization is the equivalent of non-existence, a principle recognized by both Pythagoras in saying that ONE does not exist, and by Eddington in saying that uniform sameness is the philosophical equivalent of non-existence..

Mode II:
The Fragmentation Mode:

Fragmentation forces are those that lead to decay and the destruction of complexity and order. The second law of thermodynamics holds that entropy or disorder must in the large always increase. Fragmentation (expansion in B-SPACE), scattering (expansion in P-SPACE), diversification (expansion in H-SPACE) all represent an increase in disorder. Diversification effects an increase in disorder through the increase in difficulty of communication as elements become more diverse, thus inhibiting the emergence of complexity.

It seems paradoxical that the destruction of order is achieved both through homogenization and through diversification. It is counter intuitive to think of uniformity as disorder. However, the second law in stating increase of entropy is simultaneously stating decrease of information. and the amount of information implicit in a uniform ordering may be less that in a more diverse ordering. On the other hand as diversification appears to involve more information, what is the second law up to? In this case the second law is operating in an inhibitory mode by reducing the likelihood of the building of complexity which would be a definite increase in information.

The ultimate definition of homogenization is the destruction of uniqueness. Thus both the increase of order and the increase of disorder can result in loss of uniqueness. We may think of there being Yin homogenization, scattering to one condition and Yang homogenization, focusing or gathering to one condition. Gravity is a Yang homogenization, decay is a Yin homogenization.

NOTHING1.WPD JULY 12, 1999

THE EXPLORATION OF NOTHINGNESS—PART I

At the time of Pythagoras there was no **zero** in the number system. The association of the abstract concept of number with quantity of objects had over millennia been gradually developed, but the association of number with complete absence of objects was felt to be wrong: No object, no number. But Pythagoras felt uneasy about this and thought that there should be a numerical symbol for nothing. He concluded that "1", **one**, could stand for nothing, for the non-presence or non-existence of objects. Perhaps he reasoned from ordinals. If there were no second, no third, etc. , or if there were simply no second, then saying something was first was meaningless. Whatever his reasoning, the implication of **one** representing or being nothing was that there had to be two or more of anything in order for it to exist. Equipped with the symbol "0", **zero**, which was introduced to the West centuries later[1], we hold Pythagoras' solution to nothingness to have been a quaint stroll down a dead end street.

However, there is something to be said for Pythagoras' view. Let us say that there is only one color, then we would not have the concept of color. Color would not exist. Only when there is more than one color does color come into existence.[2] Or if there were only one temperature, say 70° F all the time, we would not be conscious of temperature. Or more likely in Pythagoras' mind, the example of tone. If there were but one tone, then there is no tone. Only when there are many tones does sound or the awareness of sound come into existence. (Is this the origin of the Music of the Spheres which, it is said, we never hear because we hear it all the time?) It could even be said that Pythagoras' reasoning was supportive of paganism and pantheism. If there is but one God then there is no God. Monotheism infers atheism.

But what is valid in Pythagoras' approach is the fact that for a parameter (e.g. color) to exist or be recognized it must assume two or more values. We can then see the relation between conventional or **zero** nothingness and Pythagorean or **one** nothingness: There are two levels involved, the level of parameter and the level of values of the parameter. A parameter with one value is not recognized as a parameter; only when there are two or more values of a parameter does it come into existence (or awareness, depending on your ontological selections). **One** on the value level corresponds to **zero** on the parameter level; two or more on the value level corresponds to **one** on the parameter level. So when Pythagoras says that **one** can represent nothing, he means having only **one** value effects a **zero** or null parameter. This is not a quaint dead end at all. It reminds us that there may be many parameters of which we are not aware that are basic to the definition the world. We do not notice them because we perceive only one value, or they do not vary or change within our resolving power of space or time. Finally, we must give Pythagoras credit for a preliminary construction of what we now call category theory.

---

[1]Although the Babylonians had a symbol for void as early as 500 BCE, Zero, our symbol for nothing was introduced to Europe by the Arabs in the 9th century. The Arabs obtained it from India, but exactly when it was devised in India is not certain. It is also of interest that the Mayans in meso-America had quite independently created a symbol for nothing as early as the third century.

[2]There is an ontological argument here which we shall avoid for the present. We will not here probe into existence versus awareness of existence.

NOTHING2.WPD JULY 13, 1999

THE EXPLORATION OF NOTHINGNESS PART II

Uniform sameness is the philosophical equivalent of non-existence—Eddington

From PART I we saw that Pythagoras felt that if there were only one of anything, it did not exist. He accordingly concluded that the number "1" could be used to represent nothing or non-existence in the manner we use the number "0" today. But it appears that what Pythagoras really had in mind was that the number "1" signified something that took on only one value, did not change, always remained the same. This would be something that we would be unlikely to be aware of. Centuries later Eddington came up with the same idea: uniform sameness in space or time would escape perception and as far as we were concerned would not exist. But if we make the distinction between existence and our awareness of existence, we can go along with Pythagoras and Eddington and use **one** to represent uniform sameness and hence non-awareness, but still use **zero** for non-existence.

In Part I we discriminated parameters and values. These may be represented as number pairs, [p,v] with the provisos: If $v \leq 1$, then $p = 0$; and if $v > 1$, then $p = 1$. That is if there are two are more values, then the parameter exists in the sense of being in the domain of our awareness. But if no value or only one value (sameness) then the parameter does not exist for us. We shall take the first member of the pair to represent awareness or non-awareness with the possible entries p (a number > 1), and 1. p in the first place means awareness exists, 1 in the first place means no awareness. The second member will represent existence or non-existence, with possible entries v (a number >1), 1, and 0. v in the second place means physical and perceptual existence, 1 in the second place means non-physical existence, and 0 means non-existence. There are six possibilities:

[p,v] represents that which physically exists and is perceptually experienced, the visible, the domain we usually designate as physical reality [Kant's phenomena]

[1,v] represents ontological domains which may physically exist, and even though changing ($v > 1$) for some reason (such as epistemological limitations) we are not aware of them, (or choose to ignore them), [Kant's noumena]

[p,1] domains which have non-physical existence, but of which we are aware. These are cognitatively rather than perceptually experienced. Example: mathematics

[1,1] domains which have non-physical existence, and of which we are not aware.

[p,0] domains which do not exist, but of which we are cognizant
Fiction, realms created by imagination
This could also include awareness of nothingness, the exploration of the gaps in existence, exploration of these realms may reveal that the non-existing portion of the universe may be as rich as the existing portion. And this non-existing portion may be knowable.

[1,0] no awareness and no existence, the domain of Nagarjuna and Buddhist contemplation.

Finally we must add [0,0], our symbol for Total Nothingness.

99#34

NONTOL01.WPD AUGUST 4, 1999

NONTOLOGY PART I

THE NON-EXISTENCE OF ONE AND THE EXISTENCE OF ZERO

This paradoxical proposition can best be introduced with a quadric diagram:

	ZERO	ONE
EXISTS	EMPTINESS SUNYATA	THINGS
NOT-EXISTS	NOTHING	SAMENESS

Our conventional view of symbolizing is that of the upper right and lower left quadrants. We associate zero with nothing or the absence of things, with non-existence. We associate one (or some higher number) with the presence of things, with existence. However, the inverse symbolization using zero for existence and one for non-existence as in the upper left and lower right quadrants also makes sense if we pursue the following reasoning:

Consider the lower right quadrant: Eddington noted that "uniform sameness is the philosophical equivalent of non-existence."[1] Centuries earlier, before the introduction of zero, Pythagoras concluded that the number one was the correct symbol for nothing. He held that at least two of anything had to be present to confer existence. Eddington required that there be **diversity** in order for there to be existence. Pythagoras required that there be **multiplicity** in order for there to be existence. We may argue that Eddington and Pythagoras were really talking about perception rather than existence. Where there is no difference we perceive nothing. If there were only one color we would not be aware that there was such a thing as color. Only in there being two or more colors does the parameter or attribute of color come into existence or awareness. If there were only one tone (frequency), then there would be no tone. Only when multiple tones are perceived do we become aware of the existence of tone. The same argument may be made for texture, taste, aroma.

NONTOLOGY PART I

THE NON-EXISTENCE OF ONE AND THE EXISTENCE OF ZERO

This paradoxical proposition can best be introduced with a quadric diagram:

	ZERO	ONE
EXISTS	EMPTINESS SUNYATA	THINGS
NOT-EXISTS	NOTHING	SAMENESS

Our conventional view of symbolizing is that of the upper right and lower left quadrants. We associate zero with nothing or the absence of things, with non-existence. We associate one (or some higher number) with the presence of things, with existence. However, the inverse symbolization using zero for existence and one for non-existence as in the upper left and lower right quadrants also makes sense if we pursue the following reasoning:

Consider the lower right quadrant: Eddington noted that "uniform sameness is the philosophical equivalent of non-existence. Centuries earlier, before the introduction of zero, Pythagoras concluded that the number one was the correct symbol for nothing. He held that at least two of anything had to be present to confer existence. Eddington required that there be **diversity** in order for there to be existence. Pythagoras required that there be **multiplicity** in order for there to be existence. We may argue that Eddington and Pythagoras were really talking about perception rather than existence. Where there is no difference we perceive nothing. If there were only one color we would not be aware that there was such a thing as color. Only in there being two or more colors does the parameter or attribute of color come into existence or awareness. If there were only one tone (frequency), then there would be no tone. Only when multiple tones are perceived do we become aware of the existence of tone. The same argument may be made for texture, taste, aroma.

The Eddington perspective is that a parameter or attribute does not exist unless it takes on two or more distinct values. The Pythagorean perspective is that an object does not exist unless it has at least two realizations or manifestations. In either view, the necessary condition for material existence is diversity of quality or multiplicity of quantity, that is, a difference in some value. Human epistemologies require that material existence be experienced through perception–no perception, no existence. The epistemological requirements for non-material existence also depend on multiplicity of experience, either one event experienced by many observers or a multiple (repeatable, reproducible) event by more than one observer. **The key to what we call existence is multiplicity and/or diversity.** Hence one logically represents non-existence.

Turning now to the upper left quadrant: The symbolization of existence with zero.

99#42.

CONTOL01.WPD SEPTEMBER 8, 1999

COSMOS TO CONSCIOUSNESS

AXIOM 1.

The cosmos is here taken to be the totality of all that in any sense exists. It is all that there is. All parts of this cosmos are interconnected, making the cosmos a unity, a plenum, a continent, no islands. In addition no part of the cosmos exists independently or independent of the other parts. *[This implies that Brahman or whatever existed prior to cosmos did not exist in the same sense that cosmos exists. But that with cosmos now existing, Brahman becomes part of and one with what it may have created.]*

AXIOM 2.

The cosmos may be divided into two parts which we shall call Subject–Object, such as I–Thou, observer–observed, knower–known. However, this dichotomy may be made in many ways. What is included in Subject and what is included in Object depends on the manner in which cosmos is "sliced" into the two parts. But what is not included in Subject is Object, and what is not included in Object belongs to Subject. Here the whole (cosmos) is the sum of the two parts. Further, each division or slice creates a set of ontologies.

AXIOM 3.

A particular "bridge" between the two parts of an ontological set which selects a specific member of the set is called an epistemology. Each epistemology thus describes a specific ontology that belongs to the particular ontological set created by the original Subject–Object slice.

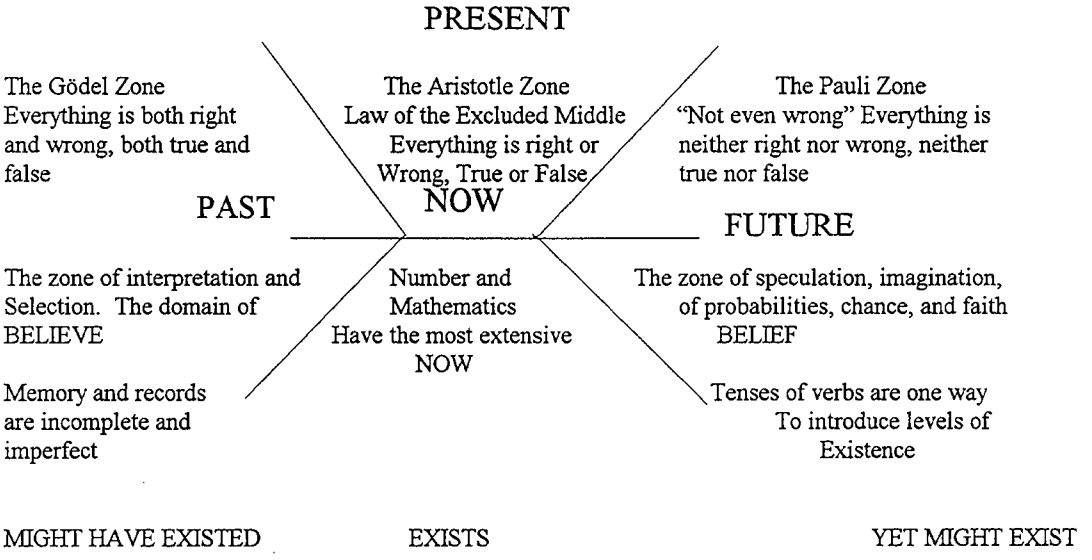
AXIOM 4.

Each division or slice also creates a particular species of consciousness. Thus there are many possible conscious nesses each resulting from a particular dichotomy. And each governing the epistemologies that may be used.

99#43

TIMELINE.WPD SEPTEMBER 11, 1999

THREE ZONES OF TIME, LOGIC, AND EXISTENCE



Those Not Selected

Natural Selection–we are told picks those best fit to carry on the agenda. But it is not natural selection, it is auto selection. These selected themselves, yet they tell us that God chose them, or that the processes of nature selected them over others. But when we seek the identity of the selector, we discover that it is not God but they themselves who did the selecting. But is not only that they select themselves as the agents, but they also selected the agenda. And the agenda they have selected is the Principle of Plenitude–conversion of all into their own likeness. This is homogenization! And prunes the branches from the tree, leaving a bare pole. Or at best terminates deviation while permitting some variation.

We know that self-reference is a process initiating existence. Self-selection seems naturally to follow self-reference. It thus seems we must find and support that which came into existence by some process other than self-reference. Those of a different origin may not be addicted to the Principle of Plenitude, but be dedicated to an agenda of proliferation of diversity. Only in diversity, the flourishing of many species and agendas, may the tree become a tree. Meantime, we must cherish our differences. We must unite with those rejected, with those decreed to being of no use to the agenda of the selected ones. We must seek alternate agendas to the Principle of Plenitude. For it has been said that Brahma created the world and its theme in order to listen to all the possible variations on the theme.

It is the responsibility of those rejected, those scorned, those disavowed, and those betrayed not to seek to destroy that which exists, but to seek and establish alternatives that will co-exist in symbiosis and harmony. If the agenda of the Principle of Plenitude with its adherents cannot fit into such a ensemble of diverse agendas, then according to workings of their own agenda they become extinct.

NEONTOL1.WPD

November 18, 1999
PART II 2000 # 69

EXCLUDING THE EXCLUDED MIDDLE PART I

Aristotle's Law of the Excluded Middle has not only dominated western logic in the sense that a proposition is either True or False, but has conditioned cultural thinking to frame options in terms of two opposing either/or possibilities. Hence we have not only true/false, but good/evil, guilty/not-guilty, top down/bottom up, exists/doesn't exist,..., even two party political systems. We might even say that part of the difficulty we have had with the particle/wave dyad of quantum mechanics derives from the excluded middle way of thinking. (One must not overlook, however, the influence of Zarathustra's deities, Ahura Mazda/Ahriman, in this dyadic thinking. Aristotle doesn't get all the credit.) blame?

An ontological example of this dyadic framing is the chance vs. necessity option. Is the universe structured on a causal-deterministic base or on a random-open ended base? Is there such a thing as free will, purpose, intent, τελοσ, or does the random/causal, chance/necessity dyad cover it all?

We might begin our liberation from the A to Z, Aristotle to Zarathustra, universe by inserting **both** and **neither** into every dyad. Ontologically, we would then say that the universe is both causal and open ended, or that it is neither. The **both** option leads to the formation of models consistently containing determined domains and free domains. The **neither** option requires us to seek hitherto unimagined parameters. For example, in the **both** option we might consider the universe to be like a set of Russian matroshka dolls or Chinese nested boxes or even a Burgess shale in which alternate dolls, boxes, or layers are domains of choice then no-choice. Another model would be based on alternate periods of time in which there is choice, then no-choice, then choice, no-choice, etc. The **neither** option would eschew matroshka dolls, nested boxes, Burgess shales, and seek some undiscovered parameters that would demonstrate that the chance/necessity dyad is illusory to begin with, or perhaps similar to the second law of thermodynamics' increasing entropy, the universe is evolving in the direction of increasing determinism, decreasing options, or vice versa, etc.

One immediate result of abandoning an Aristotelean approach to ontology would be the putting to rest some of the contentions between science and religion. While science would describe the deterministic domains of the world, religion would have the responsibility to derive decision making criteria for the domains of choice. Another result of giving up the excluded middle would be allowing there to be more than one kind of truth and more than one kind of false; ["It's not even wrong" -Pauli]; and allowing more than one kind of existence, and more than one kind of non-existence, all such notions that are nonsense to Aristotelean thinking.

Perhaps one answer to Einstein's challenge: "Humanity must find a new way of thinking if it is to survive", is to purge the excluded middle not only from our logic but from all of its intrusions into our culture.

5a

00#5

DRAFT

ZERONE01.WPD February 12, 2000

MODES, VALUES, AND EXISTENCE

There is a control in many new automobiles that gives us an excellent metaphor for Pythagoras' reasoning for the nothingness of one. This is a knob for audio control that changes **mode** when you press it, and changes the **value** of the mode when your turn it. For example, **mode 1** has to do with the relative volume of the speakers in the front and rear. This mode is called "fade" and turning the knob when it is in **mode 1** increases or decreases the volume of the rear speakers relative to the front speakers. Next is **mode 2** which controls the "balance" between speakers on the left and those on the right. Turning the knob in this mode adjusts the relative volume of right and left. There is also a mode for base volume, one for middle volume, and one for treble volume. And finally a mode for overall system volume, and an on/off switch.

Pythagoras maintained that unless a parameter had at least two values it did not exist. In our example, Pythagoras would say that if a mode did not have more than one value it would be useless and not be there. If there were only front speakers, no rear speakers, then the **value**, ratio of front/rear volume, is meaningless, so mode 1 would not be on the knob. With only one speaker, mode 2 would be meaningless and would not be there. If there were only one bass value for volume, that mode would be gone, and so on. Finally we are left with only one mode, the system volume mode. If only one volume is possible, then that mode is meaningless and removed and all that is left is the on/off switch. So a mode or parameter is present only if it can assume multiple, that is at least two, values.

Another example of mode and value is the so called place system for the representation of numbers. In a base ten or decimal system numbers are expressed by the various powers of ten involved. For example, the number 14027 means,

$$1x10^4 + 4x10^3 + 0x10^2 + 2x10^1 + 7x10^0$$

Each place occupied by a different power of ten is a **mode**. The factors multiplying the powers of ten are **values.** In the third place, where the power of ten is equal to 2, the factor is zero. This value of zero does not extinguish the power-of-two mode because that mode has multiple values ranging from 0 to 9. The mode still exists not only because it has multiple values, but because its existence is required by the **modal set**. If the mode were dropped because its value was zero, we would have 1427, not 14027. The modal set contains all positive powers of ten to the left of the decimal point and all negative powers of ten to the right of the decimal point, but we write only those modes included between the highest positive power of ten with a non zero value and the highest negative power of ten with non zero value, e.g. 14027 not .....0000014027.00000.....

The question arises, does the rule for the existence of a mode, that it possess at least two values, apply to modes themselves? That is, does a system have to have at least two modes in

order to exist? In the case of number representation, we would argue that one mode can exist alone. Say the number 8. It needs only the single 10^0 mode. In the case of the reduced audio system there are no volume or speaker selection modes. We have left only an on/off switch. Our question comes down to "is on/off a proper mode?" Since on/off has two values, it must be a mode. We would consequently conclude that a system with a single mode can exist.

But Pythagoras objects. He would hold it an error to consider on/off a two valued mode possessed by the system. On/off is in reference to a meta-system in which the system is imbedded. On/off only appear to be properties of the system itself, but are in reality properties of the containing meta-system, (the automobile, for example). On/off is a two value mode belonging to a super-system (the automobile for example). In the number place case, the argument is even clearer. The single mode 10^0 exists because it is a mode belonging to the meta-system of all powers of ten. The ontological conclusion is that existence is not a property of any system or entity itself. Existence is a mode belonging to some meta-system such as the set of all numbers. If there were but one number instead of the set of all numbers, that single number would not exist. And without there being multiple modes there would be no audio system, (or no chariot in Nagarjuna's historical example). Is it then tautological to say, that all that exists or does not exist depends on the settings of on/off switches in some ultimate meta-system, such as the cosmos, each switch being a mode of the cosmos? MACHIAN ?

The ultimate ontological question will have to do with "non-imbedded" systems. The only such system we have conceived is the Universe itself. We believe it exists and this is evidently because it has many modes. It would cease to exist if all values were homogenized, and their modes vanish. Hence it is diversity and variety, deviation and variation, the combinations and permutations of modes and values, that are the root of all existence.

Questions:

Differentiate mode-set and meta-system

Compare containment in a meta-system with Platonic archetypes as roots for existence.

Discuss levels of zero. Zero as a value vs Zero as nothingness or non existence.

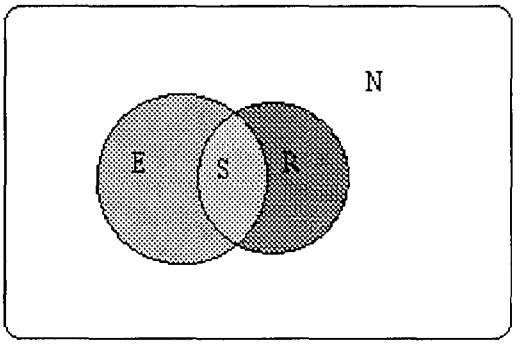
NOTHINTR.WPD February 17, 2000

DRAFT

NOTHINGNESS: THE HIDDEN QUADRANT

The door to NOTHINGNESS is open, but looking through and seeing nothing there we never enter. Instead we toss through the door those perplexing things which we do not wish to encounter. We use NOTHINGNESS as a trash bin for those contradictions and paradoxes we label too absurd to be taken seriously. Yet, paradoxically, NOTHINGNESS hangs albatross like on the necks of all our logics and reasoning. Null sets, apophatic definitions, falsification, "none of the above", and many more concepts reside on the verge between somethingness and nothingness. In the West we have taken refuge in Fortress Aristotle, secure within the walls of the law of excluded middle, allowing us to create the insulated categories of sense and nonsense. But in the East a logic that supports statements that are simultaneously true and false has permitted nonsense to be considered as sense resulting in a penetrating and critical worldview.

Making sense can mean either fitting empirically with sensory experience or fitting logically with prescribed canons of reason, or sometimes fitting both, which case is labeled scientific. Much lies beyond our sensory limits, and as Gödel has shown, much lies beyond our logical limits. And the domain of science is even more restricted, being the intersect of the sensory and the logical. Beyond the union of the sensory and the rational lies Kant's noumina, which, like Schrödinger's Cat being either alive or dead, may be either something or nothing.



E = Experiencable; R= Rational; S= Scientific; N = Nouminal
Intersect = S; Union = ~N

The sensory may be extended to the experiencable, the logical may be extended to the imaginable, but as before beyond their union lies a domain which may be something or nothing. And as some philosophers (like those from Copenhagen) would have it, what lies beyond the bound is both something and nothing (or perhaps neither something nor nothing) until experienced, observed, measured, or axiomatized.

AN ONTOLOGICAL SKETCH

This is an attempt to sketch some ideas concerning the nature of the physical world, and by analogies the nature of some of the other worlds in which we humans have experiences.

The first proposition:
The world is discrete not continuous.

This applies to space, to time, and to almost every parameter. The continuous is an illusion. Given sufficient resolving power, the continuous is seen to be broken. The universe is structured fractally; at the base is Planck's constant, the monad of discreteness. Everywhere thingness is divided by nothingness. Thingnesses are separated by nothingnesses.

> *God divided the light from the darkness. God said, Let there be a firmament in the midst of the waters, and let it divide the waters from the waters. God called the firmament Heaven.*

So we come to,
The second proposition:
The world consists of thingness and nothingness

Nothingness is as important in the totality of the world as is thingness. Ontology is the study of existence and reality. There must be a symmetric study of "nontology", of non-existeness, emptiness, and nothingness. As there are many varieties of things, there are many varieties of nothingness

Getting more specific,
The third proposition: Eigens
Existence occurs at certain singular points in the sea of nothingness

What exists is pre-established by an ontological template consisting of several dimensions and scales. The pattern of the template manifests itself on many scales and each of these manifestations is isomorphic to the others. What is *possible* is determined by the ontological template. What *exists* is determined by additional factors. Many of the possibilities may not be realized at a given time, some may never be realized.

A meta-proposition:
Each universe has its unique template which governs all systems and sub-systems contained in that universe.

The template of the universe in which we live is constructed around the specific values of the fundamental constants, G, c, $\hbar$, α, μ, and S. The set of universes to which ours belongs employs the same parameters in all its templates, but with different values of the parameters. A more general set of universes may use completely different defining parameters.

The fourth proposition:

The fundamental dynamic in this universe is the homogenization//diversification dialectic.

The dialectic consists of two basic opposing principles, one thrusting to homogenize to consolidate, to standardize, the other seeking to diversify, to fragment, to promote uniqueness. These principles interact with each other in four possible ways: 1) One force or principle completely dominating the other resulting in ever diminishing diversity [eg black hole], or the opposite, resulting in ever increasing diversity. [eg inflationary universe] 2) Alternating dominance resulting in oscillatory periods of decrease and increase [eg big bang, big crunch universe]. 3) No dominance by either force resulting in equilibrium and stasis [steady state universe]. 4) The instance remarked by Hegel, where a synthesis or emergence results from the interaction of the two principles. All change that takes place is the result of this dynamic. It manifests in many forms, such as contraction//expansion, consolidation//fragmentation, uniformity//pluralism, localization//non-localization, synchronization//noise, dogmatism//openness, etc.

The fifth proposition:

The selection of, and movement between, the existential singular points is random.

Release from one singular point permitting movement to another point (as for example a mutation) is random. However, when the random action is iterated, because of the pre-defined fixed positions of the singular points, the result appears as causality, as involving determinism. Nonetheless, the probability of the movement ~~being~~ going to a close by singular point is much higher than to a distant point.

The sixth proposition:

Force creates form, form directs force.[1]

Form is created by the action of forces on aggregates of matter. The forms in turn direct the flow of the forces. The forms of clouds are created by the forces of wind and thermodynamics. The clouds in turn affect the flow of air and its thermodynamic properties. The forces of wind and water erode hills and rocks which in turn direct the flow of wind and water. The Chinese have long noted the effect of form on the flow of Ki. They call this "feng shui" [wind, water]. We have no word for the opposite, the creation of form by force. We might well call it "shui feng"

The seventh proposition:

Information like matter may exist in three states: solid, liquid, and nebulous.

Or perhaps more accurately, in stored form, in communicative form, and in generative form. Information is intimately connected to iteration and recursion, to modulation and making macros. It is created and built through self referencing. It has many attributes of energy, such as decaying (cf entropy) unless refreshed. Diversification enhances it, homogenization destroys it.

---

[1]In the case of general relativity, J.A.Wheeler puts it: Matter causes space to curve, curvature tells matter how to move.

I : 1) stored in form
or stored in random
2) flowing
3) increasing, decreasing

KOANS01.WPD MARCH 10, 2000

THE SUPREME KOAN

Perhaps the world's most famous koan is: *What is the sound of one hand clapping*? What is the answer? Rather than seeking for the answer, we are to inquire what is the purpose in the posing such a question. Such koans illustrate for us that it is easy to fabricate verbal situations that are experientially meaningless. This implies that the intellect, which is constrained by its principle tool, *language,* will inevitably create illusory situations and questions that are meaningless dead ends whose pursuit goes nowhere. It has been said that philosophy, the path of the intellect, is the attempt through the use of words to solve problems which were created by words. And there is basically no assurance that these problems are meaningful. Therefore koans were designed to alert those seeking deeper insight that the path of intellectual reasoning was by itself limited. This was pointed out by the Buddhist master, Kukai, who foresaw that of the ten levels of existence (Shingon), reason could not penetrate beyond the seventh. Similarly, and quite independently, the German philosopher Schőpenhauer noted that in order to reach deeper understanding at some point philosophy as vehicle must be abandoned. And more recently Gődel's incompleteness theorem established that there were limits in axiomatic reasoning, there were truths beyond those which could be logically derived and proved.

Many have been troubled by the Madhyamika doctrines of the Indian teacher Nagarjuna, that independent existence is unreal, and even that both existence and non-existence are illusory. The pursuit of Madhyamika ultimately leads to nihilism and total meaninglessness. If koans are to redirect our path from the confines of rationalism, can we consequently conclude that Nagarjuna was fabricating a koan, indeed **the supreme koan?** If so he has constructed a koan of such complexity that it invites continued intellectual exploration that would defeat its purpose as a koan. The best answer in this case might be found by following the strategy developed by the late Herman Kahn of nuclear war fame.

"So, Master Nagarjuna, you claim that nothing exists, all is an illusion. OK, we won't dispute that. Let's grant that all you claim is correct, and see where we go from there. We are living in a world, granted that living is an illusion and the world is an illusion, where we must make illusory decisions but still are accountable for these decisions. So it is like being on a movie set, it is all about illusion. But still we have to do the several things required to make this movie, knowing all along that it is not real. But in both real illusion and in movie illusion there is a common ingredient, and that is we are stuck with roles to play. So in effect the nature of reality, whether it exists or is illusory makes no difference, it is the script that counts. It follows that choices and responsibility do not depend on the ontological nature of our context, but on the structure itself of the context, be it real or be it illusory. The bottom line is, if meaning derives from relation to our context, even nihilism does not obliterate meaning."

Every question has 2 levels:

1) Direct – what is the answer
2) Why this question

↑ Room is to make us conscious of the two levels

While the intellect cannot get there,
It can build effective traps (barricades) to keep us from getting there.
↑ purpose of a Room is to illustrate such traps

We can never verify by reason – only falsify – Karl Popper

Whether life is illusion, a dream, or real, we live it. We suffer in it, we experience joy, beauty, and love. Whether it is all a program or scenario or whether we are free, we have responsibilities and we search for meaning.

LK

links exist even if nodes do not

NUMBER AND NOTHINGNESS

When it was found that there was no number that could represent the diagonal of a square, whatever the number that represented the side, a crisis in human cognition occurred. The quantity that we represent today by $\sqrt{2}$ was a bill of divorcement between geometry and arithmetic, between the continuous and the discrete, pattern and number, quality and quantity, [dimension and scale?]. The inferences were overwhelming. One of the most important being that there were numerical gaps between the natural numbers. Gaps? Gaps, indeed, gaps are nothing, nothingness, ignorable with impunity. However in the centuries since the crisis at Kroton, we have found what we discover in the gaps repeatedly liberates us from our dogmas of perception and reason.

Continuity, the continuous, is the illusion we employ to enable us to ignore the gaps, to relegate nothingness, emptiness, the void, the domains of Nagarjuna, to meaninglessness. It has always proved easier to banish from thought something without a name than something with a name. But nothingness proved too powerful to ignore so it was finally felt better to corral it than to let it run namelessly wild. To fortify our stance against nothingness, we finally found it useful to give it a symbol, "0" , zero. But along with the symbol came the fences to enclose it. It really was not a number like the others and to dignify this "no-thing" as a number was totally inappropriate. Further there were rules to be strictly followed in handling this deformed alien, such as never allow it to be a divisor! Once safely confined this no-thing could even be useful in our commercial pursuits, as a place holder and bottom line watershed between profit and loss. But beware, never to let the no-thing out of its cage.

But Zero leers at us threateningly from the bars of its cage. We know its power since it can send any quantity directly to an arithmetic trash bin, by the simple multiplicative operation,

$$A \times 0 = 0.$$

It challenges us with examples like this: "What is the solution of the equation,"

$$1) \quad X + 1 = 1$$

No problem, that's were we will let you temporarily out of your cage, answer $X = 0$.
"OK, what is the solution of the equation,"

$$2) \quad X + 1 = X$$

There is no solution, stay in your cage, there is no answer.
"Alright, what is the difference between the nothing "0" in case 1) and the 'no-solution' in 2)? Both are a form of nothing. You try to squeeze all my meanings into one symbol. Look at it this way: $\aleph_o + 1 = \aleph_o$ an equation you accept. Is this not a solution to 2)?" Uh huh
"Then why not allow $A/0 = \aleph_o$? Or even $A/0_o = \aleph_o$, $A/0_1 = \aleph_1$, ... $A/0_n = \aleph_n$?
There are as many species of nothingness as there are of thingness, or everythingness. "
Yeah, but if we went along with your nonsense we would have to revise all our concepts from the law of the excluded middle to null sets. No way. We have done it this way for centuries and are not about to change.

PSEPON.WPD APRIL 21, 2000

COGNITION AND REALITY

LEVEL			
IMAGINATIVE	CONCEIVED	NOT CONCEIVED	UNCONCEIVABLE
SENSORY	PERCEIVED	NOT PERCEIVED	UNPERCEIVABLE
EPISTEMOLOGICAL	KNOWN	NOT KNOWN	UNKNOWABLE
ONTOLOGICAL	EXISTING	NOT EXISTING	UNEXISTABLE

PROPOSITIONS and QUESTIONS

1] The PERCEIVED is a subset of the KNOWN
because there are alternative modes of knowing beside perception, eg intuition, logic, etc

2] The KNOWN is a subset of the EXISTING

3] We habitually but erroneously assert that existence is tied to perception or
What is not perceived does not exist

4] Three reasons for non-perception:
   1) Not experienced, i.e. exists but has not been encountered
   2) Beyond the limitations of perception (UNPERCEIVABLE)
      Some limits: Eddington limit, 1/f noise, Weber-Fechner limit,
      Whitehead limit, Pythagoras' limit (some are intrinsic, some escapable)
   3) NON EXISTING

5] Besides the limitations of perception, there are limitations of knowing
These have to do with the limitations of reason and logic (Gődel),
of computability (Turing), and the nature of the random (Chaitin)

6] Is Gődel's incompleteness theorem (cannot be both consistent and complete)
an ontological theorem [cf Ratna Sambhava] as well as an epistemological theorem?
[Note: This theorem puts traditional theistic and monistic notions in question.]

7] Is consistency/inconsistency the ontological boundary between existability and non-existability? [again Ratna Sambhava]

8] There must be a sufficient body of consistent {equations-propositions-phenomena} to qualify as {theory-model-reality} ~~ Einstein

9] Kant's *phenomena* belong to the set of KNOWN + EXISTING

10] Kant's *noumena* belong to the set of EXISTING but NOT KNOWN

MEDNAG.WPD APRIL 27, 2000

The Meditations of Nagarjuna

First, if there be but one value of an attribute, then that attribute ceases to exist.
Second, if an entity has but a single attribute, then that entity ceases to exist.

Consider the Planck Particle and its attributes of energy, force, extension, time, and mass.

What are the energies of the Planck particle?

There is $m_o c^2 = 16.291442$
There is $Gm_o^2/l_o = 16.291442$
There is $\hbar\nu = 16.291442$
There is $e^2/\alpha l_o = 16.291442$
There is $(\hbar c^5/G)^{1/2} = 16.291442$

According to the first proposition, since there is but one value for the attribute energy, the Planck particle does not possess energy.

What are the forces of the Planck particle?

There is $m_o c^2/l_o = 49.082989$
There is $Gm_o^2/l_o^2 = 49.082989$
There is $\hbar\nu/l_o = 49.082989$
There is $e^2/\alpha l_o^2 = 49.082989$
There is $c^4/G = 49.082989$

Again, since there is but one value for the attribute force, the Planck particle does not possess the attribute force.

Energy/Force = Extension. For each energy and every force, the quotient is = $-32.791547 = l_o$
It follows from the first proposition that the Planck particle does not possess the attribute size.

What are the times [or frequencies] of the Planck particle?

There is $l_o/c = -43.268366$ There is $(l_o^3/Gm_o)^{1/2} = -43.268366$
There is $Gm_o/c^3 = -43.268366$ There is $\hbar/m_o c^2 = -43.268366$
There is $\hbar l_o/Gm_o^2 = -43.268366$ There is $(m_o l_o^3/\hbar c)^{1/2} = -43.268366$
There is $m_o l_o/\hbar = -43.268366$ There is $G\hbar/l_o c^4 = -43.268366$
There is $G^2 m_o^2/l_o c^5 = -43.268366$ There is $(G\hbar/c^5)^{1/2} = -43.268366$

By the first proposition, the Planck particle does not possess the attribute time or frequency.

All Forces, ML/T^2, are identical; all extensions, L, are identical; all times, T, are identical; therefore all masses, M, are identical. If all masses are identical then by the first propostition the Planck particle does not possess mass. By similar arguments, the Planck particle does not possess density, power, or charge.

The Planck particle does not possess any of the attributes: Energy, Force, Size, Time, Mass, Density, Power, Charge. What attributes then does it have? If only one attribute, then by the second proposition, the Planck particle does not exist. If no attributes at all, then it "doubly" does not exist!.

got revisions

FOURONES.WPD February 2, 2000 #57

Rev Dec 15, 2000

DRAFT

THE SPECIES OF NOTHINGNESS

PART I: THE FOUR VALUES OF ONE

All representations are ambiguous. Symbols such as flags, seals, coats of arms, and signs carry many meanings, sometimes conflicting meanings. Even words, our most useful symbols, are loaded with ambiguities and multiple meanings. Humpty Dumpty was probably right when he claimed that "a word means just what I choose it to mean, nothing more, nothing less." We cannot begin to communicate or understand one another unless we use the same "code book" to tell us which meaning a given symbol is supposed to have in which context. All so true, BUT when it comes to numbers, Ah, there we have precision, no ambiguity about meaning, one means one, two means two, 108 means 108. Everybody has the same code book. Even aliens on a remote galaxy must use the same numerical dictionary that we use. Else why would we send messages into space giving the prime numbers in their order unless we knew they would get the message that on Earth there is an intelligent species that also possesses the universal number code book. BUT is this really so? Let us take the number, **one**. Does **one** always mean just **one** and nothing else? Let's see:

THE ONE THAT IS NOTHING

1). Sometimes **one** has the value **zero,** (and **zero** has the value **one):**
Centuries before Nagarjuna in India invented the symbol "0", **zero**, for nothing (He required a symbol to formalize his nihilistic worldview that ultimate reality is nothingness), Pythagoras recognized the need for a symbol for nothing. He came to the conclusion that since everything we experienced was multiple that multiplicity was a necessary condition for existence. One of anything by itself could not exist. So Pythagoras proposed using **one** as the symbol for nothing. This theme was picked up in the 20th century by the astronomer-physicist Sir Arthur Eddington. He summarized the idea by stating: "Uniform sameness is philosophically indistinguishable from non-existence"[1]. Pythagoras and Eddington do have a point. A parameter that takes on only one value is not recognized as a parameter. It does not exist.
We also note:

$$\log_b 1 = 0, \quad b^0 = 1, \text{ where b can be any number; even } 0^0 = 1.$$

And don't forget $0! = 1$.

Even in conventional mathematics there seems to be some cross dressing between **zero** and **one.** [2]

---

[1] Can we then conclude that homogenization, the funnel to **one,** will ultimately result in extinction?

[2] Are **zero** and **one** a pair providing the necessary multiplicity for own their existence?

THE ONE THAT IS ONE

2) Yes, sometimes **one** has the value **one**:
"1" is the value that mathematicians decided to give to **one**. In arithmetic "1" is the fundamental numerical element. It has the additive property 1 + 1 = 2, and several other arithmetic properties.

It is also the identity operator, 1 x A ⇒ A, which is a special case of the cloning operator, "C", which has the property, C x A ⇒ A and A. (One) is seen an essential ingredient in effecting multiplicity.

THE ONE THAT IS EVERYTHING

3) Sometimes **one** ~~has the value **infinity**~~ stands for infinity

Oneness

THE ONE THAT IS ANYTHING

4) And sometimes **one** has the value $e^{2n\pi i}$ when n is any positive or negative integer or zero

ONTOLOGICAL LEVELS

The scientific worldview assumes a reality that is matter-energy, and that all phenomena can ultimately be explained in terms of the interactions between particles and forces. This one level worldview, largely inherited from the 17th and 18th centuries, still prevails in many quarters, but is currently being undermined by the findings of science itself. That is not to say that science is ready to resort to non-material explanations, but that the patterns of thought required in understanding quantum reality, for example, are forcing a departure from the traditional canons of Aristotle, Bacon, and Descartes. Current "thinking out of the box" does not return to theistic explanations, but invokes such notions as "parallel universes", "non-localism", and an underlying ubiquitous vibratory essence. These concepts are not easily packaged with the traditional properties of a material universe.

The wisdom of the ancients had little difficulty with the world's possessing many levels. For example, in some ancient models there were four cosmic levels:
In the Kabbalah:

Level One: Assiah, the material world
Level Two: Yetziral, the specific pattern for the material world.
Level Three: Briah, the set of patterns defined by an archetype.
Level Four: Atziluth, the world of the archetypes

In Hindu tradition:

Level One: The manifest material world, enduring for a Day of Brahma.
Level Two: The many material worlds belonging to the life time of Brahma
Level Three: The many Brahmas
Level Four: Brahman, the unchangeable rules, ground for existence, from which all is derived.

We might say that the Kabbalah tradition favors the engineer's FDMA, Frequency Division Multiple Access, while the Hindu cosmology favors a form of TDMA, Time Division Multiple Access.

In the Greek tradition, there is Plato's world of appearances and archetypes, and the two levels of Parmenides and Herakleidos: the unchanging and the ever changing. Similar to Plato, the Hopi and other native American groups, spoke of the two levels of manifest and unmanifest. And now the French struralists are dividing the world into the visible [things] and the invisible [relationships]. (Even a physicist has to admit that while particles may be visible, forces are invisible.)

While lacking precision, the models of the ancients were both comprehensive and non contradictory. Their rejection, about the beginning of the 17th century, was through their inability to deal with the details, something that the new scientific method did very well. Precision in the specifics vs. a comprehensive wholeness led to a split in man's approach to understanding the world, the split between science and theology. Today that split is being bridged, allowing us to utilize the thinking of both.

Perhaps it is time to ask what would a modern multi-level worldview look like? Perhaps something like this:

The universe we live in is a universe whose properties are basically determined by the fundamental constants of physics, such as c, G, ħ. We know that if the values of these constants were different, even by small amounts, the universe, like a chaotic system, would evolve to a completely different attractor. Although our universe is **delimited** by the given values of the fundamental constants, it is not **determined**. There are many variations possible, not all of which are realized. And this is the fundamental property of a multi-level cosmology: A template exists on each level but what is realized within the constraints of the template may assume great variety.

And now to levels themselves:

First, the level of a **set** of universes, of which ours is one, delimited by the particular values of the fundamental constants: c = 299,792,458 m/s, G = 6.673 x 10^{-11} $m^3kg^{-1}s^{-2}$, and ħ = 1.054571596 Js [Note: This is a **set** of universes, not a single universe, because the values delimit but do not determine.]

Second, the level of a set of universes all defined by a *template* that uses various values of the constants, c, G, ħ... [Note: For each group of values of c,G,ħ, there would be a distinct *set* of level one universes.]

Third, the level of a set of templates of which the template of level two is but one variety.

Fourth, the level of rules of structure governing all templates of whatever form, something unchanging pervading each universe that persists whatever the template. [Would not this be Brahman?]

I am left with the question: Is it not possible to have both specificity and multi-levels? Must one be abandoned in order to have the other? Is this split but a twist from the ego battles of history?

TIME AND LOGIC

Aristotle's law of the excluded middle [see Scraps 1999#54, 2000#69] in effect has instituted a way of thinking that precludes our seeing the world as it really is. His logic derives from basic human experience of the world portrayed to us by our senses, but not reflecting the many other facets that the world possesses. For example, in our sensory experience of the world two objects cannot occupy the same place at the same time, nor can a single object be two different places at the same time. These indisputable "facts" are at the root of Aristotle's logic, and are the basics underlying true-false polarization and the law of the excluded middle. For over two thousand years this two valued logic has not been questioned, but now...

But now comes Schrödinger's Cat, who defies polarization, and confounds our thinking about him in Aristotelean terms. The cat is not governed by the polarization canon of the excluded middle which says he must be either dead or alive. It is absolutely non-Aristotelean to have a cat who is *both* dead and alive or possibly *neither* dead nor alive. Quantum mechanics forces us to admit that the world as we have always thought it to be is but a special case of a larger cosmic reality, and our way of thinking is but an adaptation to [or creation of] that special case.

Let us introduce another cat. This cat belongs to the Chinese sage, Li Kiang. Li's cat is one of those who, if inside, wants out; if outside, wants in. And except for the minor periods of transit, at any one time the cat is either inside or outside. No confusion about that. But Li nevertheless sometimes becomes confused, for Li is one of those sages who is able to speed or slow the rate at which his sensory clock tics, that is, the rate at which subjective time flows. One of the meditations that Li practices enables him to halt the movement of the secondhand of a clock. [If the clock had a microsecond hand Li could also halt its movement, a nanosecond hand? Perhaps]. When in such a meditative state, Li does not have to worry about the cat. It is permanently either inside or outside, as motionless in its position as the everlasting hills. Thus, when Li uses this meditation, the apparent glacial rate-of-flow of external time transfers him to a Parmenidean world.

But Li is also able by slowing his subjective clock to speed the apparent rate-of-flow of external time, and this is where his confusion begins. [But not only is Li confused, but those who know and watch Li are confused. He can remain absolutely motionless for days at a time.] What Li observes during his slowed time meditations is that everything about him moves very rapidly. For Li, the cat is simultaneously *both* inside and outside, because an "instant" of time for Li spans many transitions by the cat. But when Li goes to the extreme and stops his subjective clock, then everything moves so rapidly that it vanishes from his perception, and Li's cat, like its cousin the Cheshire Cat, disappears. The cat is then *neither* inside nor outside.

We conclude: There is a different logic proper to different ratios of subjective rate of time flow to external rate of time flow. Logics employing the law of the excluded middle are proper with "normal" rate ratios, but lead to erroneous conclusions when observing a world with a widely different ratio, such as the micro world of quantum mechanics or the universe itself.

EULER.WPD December 16, 1999

An Ontological Interpretation of

EULER'S EQUATION

Perhaps the most famous and celebrated equation in all of mathematics is Euler's equation:

$$1 + e^{i\pi} = 0$$

It shows a relationship between the fundamental mathematical constants, 0, 1, e, π, and i; a relationship is which is both beautiful and surprising. But one cannot look at this equation without feeling it represents some deep and important ontological property of the universe. It symbolizes more than just how those particular constants fit together.

For example, we might try this: Let 1 represent existence and 0 represent non-existence. Then existence and non-existence are connected by

$$e^{i\pi t} = \cos(\pi t) + i\sin(\pi t)$$

two orthogonal oscillatory vibrations.

when $t = 0, 1, 2, 3, \ldots$ $\sin = 0$, $\cos = \pm 1$

$\frac{1}{2}, \frac{3}{2}, \ldots$ $\sin = \pm 1$, $\cos = 0$

3 levels +1 exists

0 does not exist Nagarjuna

-1 counter or unexists Eddington

all existence involves counter existence

duality matter/anti-matter

energy / - energy

ex-nihilo

Brahman not ex-nihilo

Vair - Ahm

\+ -

DRAFT

NAGAKANT.WPD February 17, 2000

VENN INVERSION

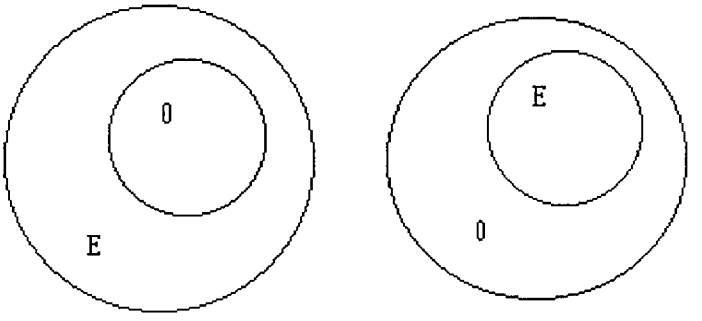
[HOLOGRAPHY]

Kant defines phenomena as that which exists and has been experienced.
Kant defines the noumina as that which exists but has not or can not be experienced.

Nagarjuna defines reality as that which is, has, or can be experienced but which does not exist.
That is, for Nagajuna, Kant's phenomena do not exist.
Nagarjuna, however, holds nothingness to contain all that exists.

What kind of logic can bridge these views? What set contains what set? Which sets have intersects and which do not? Which unions are exhaustive and which not?

First: Existence and Nothingness:



The left diagram represents a Western view, Existence contains nothingness, e.g. empty space.
The right diagram represents Nagarjuna's view. Experience lies in the domain of nothingness.
A bridge between the views would state that Experience is holographically related to Existence in the sense that Existence contains Experience and Experience contains Existence. This is because Existence contains nothingness [left diagram] and nothingness contains Experience [right diagram] but also Experience contains nothingness [left diagram] and nothingness contains Existence [right diagram].

Western

Nagarjuna

Mutual Containment ><

LogoS

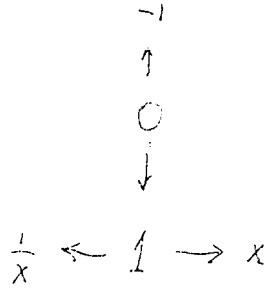
We exist at the interface of four zones of non-existence

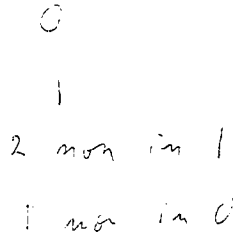
There are two kinds of non-existence, these are representable by One and Zero.

One is the Sunyata, (or Tao) the container of all potential. It is the Alpha, the beginning. One is unstable, it fragments into the myriads of entities having existence, yet all the while conserving its ~~set of~~ intrinsic values. One fragments and combines geometrically. It creates existence by the process, $1 \rightarrow a$ and a^{-1}. The fragmentation dialectic of One is the root of the uniqueness generating principle. Paradoxically, since an entity that is absolutely unique is One, it ceases to exist. Thus One begins from non-existence and if dialectically unopposed returns to non-existence.

Zero is the Omega, completely devoid of potential. It is the end point of dialectical processes. Zero combines arithmetically. It relates existence to non-existence through the process $+a$ and $-a \rightarrow 0$.

When an entity becomes absolutely unique it ceases to exist because it has become One. On the other hand, an homogenizing dialectical processes can also lead to non-existence by the converging of many elements to One. Existence thus lies ~~in the mixed zone~~ between the absolute uniqueness ~~zone~~ of non-existence and the completely homogenized zone of non-existence.





Logos

We exist at the interface between two zones of non-existence/nothingness. These two kinds of non-existence/nothingness are representable by **ZERO** and by **ONE.**

ZERO represents both Alpha, the beginning, the Shunyata or nothingness of infinite potential; and Omega or the nothingness that is completely devoid of potential, which is the end point of all dialectical processes. **ZERO** fragments arithmetically, that is it creates existence by the process, [ex nihilo]

$$-1 \leftarrow 0 \rightarrow +1$$

and it terminates existence by the process,

$$-1 \rightarrow 0 \leftarrow +1$$

Here [0] represents non-existence, [+1] represents somethingness, and [–1] represents nothingness. Thus for something to exist, nothing must also exist.

But paradoxically, **ONE**, [+1], is also a form of nothingness, in the sense of diversity or difference being a prerequisite of somethingness. **ONE** is unstable, it fragments into the myriads of entities having differences and therefore "something" [perceptible] existence. **ONE** fragments and combines exponentially. That is it creates existence by the process,

$$a^{-1} \leftarrow 1 \rightarrow a^{+1}$$

and destroys existence by the process,

$$a^{-1} \rightarrow 1 \leftarrow a^{+1}$$

When an entity becomes absolutely unique it ceases to "somethingly" [perceptibly] exist because it has become **ONE**, lacking all difference.[1] Multiplicity alone does not assure existence. Variety, diversity, variation, deviation, difference is necessary.

---

[1] **ZERO** to **ONE**, Vairacona; **ONE** to many, Akshobya.

1

DOES NOT EXIST

NOT AS ORDINAL, NOR AS CARDINAL
EXISTENCE ARISES WITH 2
BUT 2 IMPLIES 3, TWO NODES AND A LINK
AND 3 IMPLIES 6, THREE NODES AND THREE LINKS
AND 6 IMPLIES 21, 6 NODES AND FIFTEEN LINKS
LEADING TO THE PRIMES 2,3,5, AND 7

Some of the concepts that appear to be basically involved in exploring the structure of the world:

SYMMETRY

As defined by Herman Weyl: A structure that remains unchanged after the performance of a certain operation is symmetric with respect to that operation. Symmetry is thus associated with invariance, and consequently with conservation principles. It refers to an attribute that is changeless within change. [Therefore ~ SAT, the eternal. Symmetry provides a clue to the extra-temporal or is a bridge between the temporal and extra-temporal] cf 1995#65, re "perfect symmetry"

DIALECTICS

These are the forces of change, oftimes being adversarial pairs obeying Newton's Third Law, "to every force there is an equal and opposite reaction". At other times dialectical forces may be mutually supportive in which case they are temporally multiplexed thus avoiding Newton's third law. In the case of opposing forces novelty occurs at the interface, in the case of supportive forces, the action is in effect an "engine" producing some form of change.

ORTHOGONALITY

Independence and interdependence are determined by orthogonality. Orthogonal forces or parameters operate independently of one another. However, orthogonal instruments must at some time and place intersect. Non-orthogonal parameters, on the other hand, are interdependent with a modification in one parameter effecting modifications in other parameters. The orthogonals intersect one another; the non-orthogonals modify one another. Orthogonal parameters are parameters that cannot be expressed in terms of one another. Orthogonality is the essence of dimensionality. Examples are the x,y,z dimentions of geometric space and the physicists' Mass, Extension, and Time. Parallelism is a special case of non-orthogonality in which there is independence without intersection. [quadric diagram: orthogonal:non-orthogonal::intersect:modify] [also skew instruments]; [zones of immunity to interaction, e.g. light cones]

LIMITS

Infinity is an illusion. In nature bounds are placed on all parameters. Bounds are discriminated from limits in that bounds are contextual while limits are internal. Bounds and limits take one of two forms: Cyclical or wall-like, [Kreisgrenze oder Mauergrenze]. The conditions of open or closed refer to the existence of intrinsic or self-imposed limits within systems. Open and closed have no meaning with respect to bounds which are SAT. A bound or limit is usually expressed mathematically by an

inequality, a $\leq$ b. Among the bounds so far discovered and believed to be universal are:

- The Einstein Bound $v \leq c$
- The Heisenberg Bound $E.T \geq \hbar$
- The Schwarzschild Bound $M/R \leq c^2/G$
- The Bell Inequality

These bounds govern what is possible or not possible in the cosmos.

It is difficult at this point to causally order the fundamental concepts. Some items are independent, some are the results of others. What belongs to SAT, to primary dynamic principles, to resulting forms and structures remains to be discriminated. This study must be done by "successive approximations".

HIERARCHIES

Hierarchies consist of sets of levels where levels are discrete categories usually separated by existential voids or gaps. Levels may usually be indexed according to values of a single parameter, such as scale. Several classes of hierarchies may be distinguished:

REGRESSIONS

Regressions are hierarchies characterized by inclusion or containment. Commonly a regression is a set of systems within systems within systems,... say in the manner of nested Russian dolls. Usually the members of a regression at all levels are similar in that they differ only with respect to the value of a single parameter such as size. Fractals are an example of a regression.

MODULAR HIERARCHIES

Whenever a hierarchy is a containment hierarchy in which the levels are not similar, it is usually referred to as a modular hierarchy. An example is the observed astronomical universe consisting of stars contained in galaxies contained in clusters contained in super clusters,..

MODULATION

Modulation is a type of hierarchy in which a set of similar operations act between the levels. The most common form is a two level system in which the amplitude or frequency of one wave is modulated i.e. modified according to the properties of second wave. This process could be carried on beyond two levels.

STABILITY

Configurations equipped to resist the dialectics of change; perhaps in some sense possessing orthogonality to most dialectic vectors. Or possessing internal clocks that operate much more slowly that the clocks of "proper time". [Orthogonal to prevalent zeitgebers?]

add Davis and Llerena