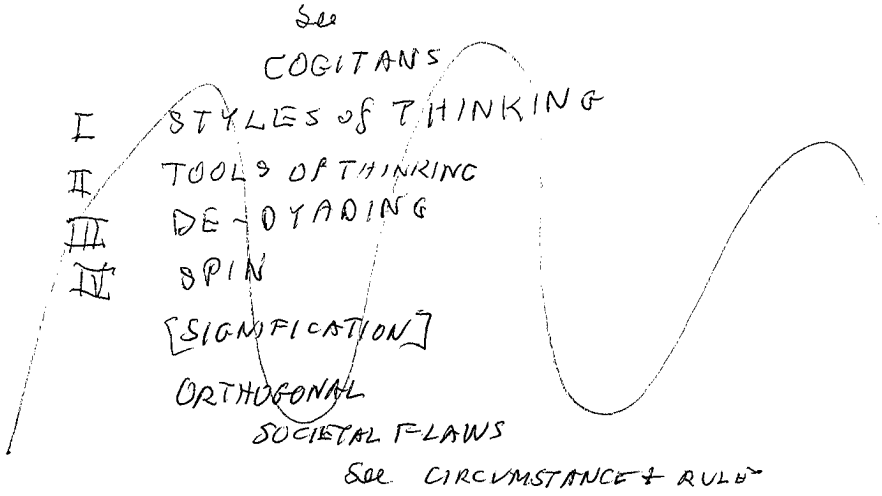
COGBK01.WPD March 6, 2003

COGITANS

TOOLS AND STYLES OF THINKING


See
COGITANS
I STYLES of THINKING
II TOOLS OF THINKING
III DE-BYADING
IV SPIN
[SIGNIFICATION]
ORTHOGONAL
SOCIETAL F-LAWS
See CIRCUMSTANCE + RULE

COS

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 (Gödel),
of computability (Turing), and the nature of the random (Chaitin)

6] Is Gödel'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

DaVinci.wpd January 30, 2004

SEVEN CRITICAL PRINCIPLES of Leonardo da Vinci's Genius

- *Curiosita*: Acquire insatiable curiosity in your approach to life.
- *Dimonstratzione*: Commit to test knowledge through experience.
- *Sensazione*: The continualy refine the senses, especially sight, as the means to clarify experience.
- Sfumato: Be willing to embrace ambiguity, paradox, and uncertainty.
- *Arte/Scienza*: Develop a balanced perception between science and art, logic and imagination, discovery and invention.
- *Corporalita*: Cultivate ambidexterity, fitness, and poise.
- *Connessione*: Develop a recognition and appreciation for the connectedness of all things and phenomena.

To da Vinci's principles might be added:

- Never be satisfied with only one solution or answer. Seek as many alternative solutions and answers as possible.
- Be willing to leave all alternatives on the table of discourse, however diverse or seemingly useless they may appear.
- Consider all possible contexts, and the effects of their inclusion or exclusion.
- Master the ability to abstract, generalize and utilize metaphors.

PIECES OF THE PUZZLE JUNE 1999

1. DYADS
2. DIALECTICS
   - Homogenization//Diversification
   - Stability//Change
   - Realization//Potentialization [The Great Dialectic]
   - Materialization//Etherialization
3. SPACES
   - P-SPACE POSITION or PHYSICAL SPACE
   - H-SPACE PATTERN, ARCHETYPE, GENOME SPACE
   - B-SPACE BONDING, CONSOLIDATION, MERGER SPACE
   - O-SPACE OPTIONS, ALTERNATIVES, DECISION SPACE
   - S-SPACE INFRASTRUCTURE, GROUND SPACE
4. FOUR
5. PYTHOGOREAN COSMOLOGY
   - The Planck value for the Hubble parameter
   - Cosmology without telescopes
   - The four quadrants
6. TIME
7. CORTEZ//MOCTEZUMA
8. NODES//LINKS
9. ATHROISMATICS
   - PARTS//WHOLES
10. TOP DOWN//BOTTOM UP
    - GOD//REDUCTIONISM

References & Quotes:

Crystal & Dragon - Wacle

TOWARD AN INFRASTRUCTURE FOR ORGANIZING NEWTHINK

The primary task is the construction of a framework which can 1) consistently contain representations of the totality of human experience, 2) permit ready retrievability of any portion of its contents and 3) allow for facile expansion. This task involves formulating a morphology of conceivable ontologies together with their paired epistemologies. It also requires a generalization of the concept of **consistency** (as perhaps with the aid of such notions of facetism and meta-consistency, see glossary). NEWTHINK must be useful for both the primary epistemological task of fabricating an organizing schema and for the secondary epistemological task of properly locating the representations of experiential events within the schema.

Whereas NEWTHINK involves:

NEW PARADIGMS and NEW CONCEPTS
NEW ONTOLOGIES
NEW EPISTEMOLOGIES
GENERAL SYSTEMS THEORY
HOLISTIC THINKING
NEW VALUES etc.

and contains elements of each, it goes beyond all of these. Let us consider each of these in turn with regard to their contribution toward alternate ways of thinking.

First, NEW PARADIGMS and NEW CONCEPTS alter our thoughts and influence the direction our thoughts take but do they constitute a new way of thinking? To get a handle on this question, consider a laundry list of some new paradigms or concepts in juxtaposition with a second list of new or alternate ways of thinking. (New here refers to ideas not yet in the main stream of human thinking, primarily exercised only by those within specialized fields. The idea of 'laundry list' is that of a collection only, no ordering or organization implied.)

NEW CONCEPTS	NEW (OR ALTERNATE) MODES OF THINKING
Cybernetics	Totalism: All possible solutions
Brown's 'Laws of Form'	Facetism: Difference = aspect
Fractals	Perspectivism, von Bertalanffy
Abstract spaces	Multivalency, Jencks
Hilbert space	Complementarity, Bohr
Banach space	Trans-rational thinking
Hausdorf spaces	Meta-consistency
Hamming space	Vertical logic
Synchronicity	Solution vs. Confrontation
Holograms	Cooperation vs. Competition *
Reality by consensus	Contextualism *
Chaos theory	Subjectivism
Parallel Universes	Anticipation, Platt
States of Consciousness	Parallelism and Pluralism *
Non-Zero Sum Game	Post Objectivity
Platooning Traffic	Multi-level thinking
Forms of Self-Reference	Linguistic eclecticism
. . . . .	. . . . .

What emerges from comparing these lists is that new paradigms and concepts are like new words in our vocabulary, whereas a new way of thinking is like having a new grammar, or better, an entirely new language. A second feature that emerges from the right hand column is that the language of NEWTHINK will of necessity be multi-linguistic, consisting of several 'para-languages'.

* Items that are currently in the main stream.

GLOSSARY

Anticipation: Platt notes three historic modes of human learning. First, survival and extinction; Second, trial and error; Third, anticipation and action. The third mode has been developed largely within the age of science. We are able to model a situation and run it to its denouement without requiring its acting out in the real world. We may select what actions to take or not take in accordance with the results of the anticipation. The failure of mode three lies not so much in errors in the anticipation as in indecisiveness in action. However, even with this powerful and economic approach most people have to learn where the edge of the cliff is by falling over it.

Contextualism: This idea has taken hold following widespread consciousness of environmental impacts. It is summarized in the cliche, 'You cannot do just one thing". Side effects, spinoffs and impacts, whether positive or negative, have become part of the consideration in the undertaking of most processes. This is the essence of what is called 'holistic thinking'. However, NEWTHINK adds another aspect to the idea of the role of the context. Whereas, holistic thinking takes into account the context by causal considerations of the impact of a system outwardly on its environment, NEWTHINK also looks at causality in the reverse direction--from context to system. In this sense NEWTHINK abandons reductionism as the sole causalistic mode. While reductionism requires the direction of causality to be from the concave side of the system to the convex side, contextualism permits causality to proceed in the opposite direction.

Cooperation vs. Competition: On the **organism** level the Principle of Plenitude lies at the root of all competitiveness. (Even species of inter-stellar molecules compete in both senses of the Principle of Plenitude.) On the **ecology** and **societal** levels, on the other hand, cooperation is of the essence. Since no organism is an island, all exist on both the organism and ecology levels, the selection of level is a subjective matter, a matter of consciousness. NEWTHINK requires a consciousness that can move between levels. In this case knowing when to cooperate and when to compete instead of making into a dogma the competitive interpretation of the Darwinian 'survival of the fittest'. (The fittest are quite frequently those who can best cooperate.) A current paradox is the U.S. position vs. Japan. We are not competitive on the international scale. However, within the U.S. the situation between corporations is highly competitive, while within Japan, there is a high level of coordination and cooperation. Competition-cooperation must be resolved taking into account levels.

Facetism: From the total set of alternative views the task is to synthesize a meta-view which contains each member of the set and consistently represents each member as a facet or aspect of some greater whole. For example, an object from one point of view is seen as a circle, from another point of view as a rectangle. Instead of adopting an adversary relation between the views and rejecting one, assume both are valid and synthesize, in this case by introducing a higher dimension, and visualize both figures as two aspects of a cylinder.

Linguistic Eclecticism: The ability to shift between metaphors and languages, whenever such is useful to describe or model a phenomenon, is essential to NEWTHINK. The scientific hangup of avoiding all allegorical, mythic, or poetic descriptions and the general hangup of avoiding all mathematical descriptions are both limiting and defeating. It is most interesting to note that in many modern texts on cosmology and other branches of physics the concept of God appears. This, not as a referent to any traditional theological dogma, but as an appropriate component of a model which facilitates its exposition. Much in modern mathematics of the transfinite has found parallel conceptualization in the works of medieval theologians. Much in general systems theory has found parallel representation in myth and fable.

Meta-Consistency: Helpful in explaining this concept, is the metaphor of knowledge as a mega-molecule. Classical consistency has to do with what local structures are possible, (e.g. hexagonal or triangular linkages) while it may be possible globally to join parts of the molecule back on itself in ways that complete a connected structure but have nothing to do with the set of allowable local linkages. Thus concepts may violate what is understood as consistency locally and yet be globally

consistent. Certain disciplines that we hold to be incompatible may indeed be globally consistent with one another. While we have traditionally assumed the topology of knowledge to be planar, the problem in NEWTHINK becomes the determination of the proper topological structure of the body of knowledge in its present state when comprising the totality of experience. Is it to be modeled with a topology of higher genus or must we settle for a cognitive continent of doxa surrounded by isolated islands of specialized non-conforming knowledge.

Multi-level Thinking: Understanding what a level is, what levels are involved in the situation, and what level the thinker is on are all essential to NEWTHINK. (As an example see the competition-cooperation case above.) An attribute of the NEWTHINKER is the ability to facilely switch between levels and always be conscious of what level he is on.

Parallelism and Pluralism: Here the NEWTHINK wisdom lies in recognition that our wealth lies in our differences. On the organism level we compete with and fear that which is different. On the societal level we must recognize that survival, progress, and richness of choice lies in generating and preserving differences. Variety is to the ecology or society what numbers are to the organism. Parallelism is the doctrine of the value of the pursuit of many paths (cf. Totalism). Implicit in parallelism is the process of departure and return (the natural dialectic). A period of isolation to develop unique attributes followed by a period of exchange to test, filter and coordinate the attributes.

Post Objectivity: Quantum reality has exploded the illusion of classical scientific 'objectivity'. Whereas a scientist may wish to preserve a detached point of view with regard to his results, it is impossible to be objective in the sense that his observations are independent of him or he of his observations. This has led to an ontological revolution whose outcome is yet unforeseen.

Solution vs. Confrontation: This is a subjective or attitudinal component of NEWTHINK. It is the anti-adversarial approach. It demands focusing on solutions rather than on prevailing. It asks us to switch rather than fight. Negotiations would be conducted by both parties jointly attacking the common problem ab initio rather than coming to the table with pre-positions to be pushed and defended.

Subjectivism: Here NEWTHINK goes beyond Post-Objectivity (which see). Not only does the observer participate in the event through making an observation, but the event is influenced by the state of consciousness and state of mind or attitude of the observer. The truth of this, while widely recognized, has been ignored because it places on us the heavy responsibility of disciplined thinking.

Totalism: This notion was implicit in Zwicky's Morphological Thinking. The idea is not to find a single solution, but to search for the totality of solutions. For example, Zwicky became interested in proofs of the Pythagorean Theorem and collected numerous novel and classical cases from which he hoped to be able to construct a matrix which would allow him to display additional proofs and adumbrate all possible proofs. J.D. Barrow picks up on the importance of this idea in his "World Within the World" p.279.

Trans-Rational Thinking: This is thinking supplemented by meditation or some other trans-cognitive path. It is supplementing the intellectual way of knowing with alternate-state ways of knowing. There is the example of the Stanford researcher into the nature of meditation, who approached the problem scientifically, then finally decided to learn to meditate himself and in gaining a whole new perspective on the problem was able to augment his scientific results. There is the case of Velikovsky who predicted several then unknown planetary phenomena by comparative analyses of myths. He proved to be right but was denounced by scientists for his approach. NEWTHINK allows one to buy his hypotheses from the lepechrauns if he so wishes, since the test for validity of an hypothesis is independent of the source of the hypothesis.

Vertical Logic: G. Spencer Brown distinguishes between the logic of crossing (horizontal or Aristotelian logic) and the logic of naming (vertical or representational logic). This distinction resolves many classical paradoxes.

Second, we must consider the role of NEW ONTOLOGIES on how we think. The inputs to new ontologies come from many sources, study of the brain and nervous system, from relativity, quantum mechanics, experiments in psychology, comparisons with mystical experiences, etc. There is no question that our view of reality, who we are and the nature of the world deeply affect all of our thinking. So it is useful to list some alternate ontological views and study their impact on our thinking.

PARG, P57 for Cog

Theaetetus' first definition of knowledge is aisthesis (sensation or perception). The second is onoma, the designation of the objects of perception in naming. The third is logos, the fullness of thought in the formulation of the sentence in which one thing is formally the predication of another. In the most general way, we may anticipate that they look like the great domains of the "rightbrain", the right cerebral cortex, (perception); and then respectively in the left brain, Wernicke's area (naming), and Broca's area (predication or syntax).

aisthesis
onoma
logos

FOR COGITANS
ALSO
INFORMATION
CURRENT CULTURE

DaVinci.wpd January 30, 2004

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of Leonardo da Vinci's Genius

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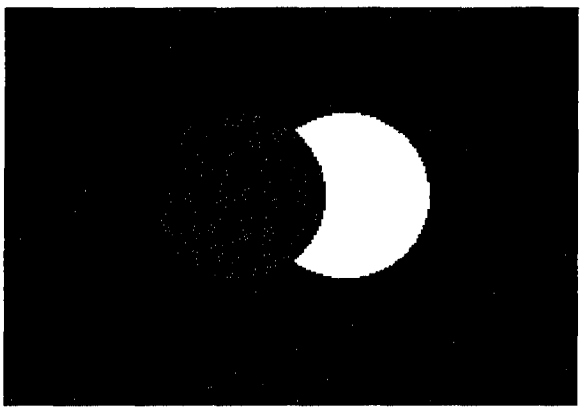
To da Vinci's principles might be added: [LI KINGI

- Never be satisfied with only one solution or answer. Seek as many alternative solutions and answers as possible.
- Be willing to leave all alternatives on the table of discourse, however diverse or seemingly useless they may appear.
- Consider all possible contexts, and the effects of their inclusion or exclusion.
- Master the ability to abstract, generalize and utilize metaphors.
- Be willing to unlearn any dogma and fragment any construct in order to have freedom for search and design.



THE BLUE REPRESENTS THE TRUE

THE YELLOW REPRESENTS THE FALSE

THE GREEN REPRESENTS THE INCLUDED MIDDLE
THAT WHICH IS BOTH TRUE AND FALSE
THE VERGE

THE RED REPRESENTS THE EXCLUDED CONTEXT
THAT WHICH IS NEITHER TRUE NOR FALSE
THE CUSPS

FOR TRUE/FALSE WE CAN SUBSTITUTE
RIGHT/WRONG, GOOD/EVIL,
INSIDE/OUTSIDE, NECESSARY/SUFFICIENT
BEFORE/AFTER, CAUSE/EFFECT
EXISTS/NOT EXISTS
INCLUDED/EXCLUDED

PSYCHOLOGY

SUBJECTIVE

ATTRIBUTES:

YIN THINKING	YANG THINKING
YIN APPROACHES	YANG APPROACHES

CONTEXTUAL	CONTENT
LOOKS OUT	LOOKS IN
LOOKS FOR COMMONALITIES	LOOKS FOR DIFFERENCES
INTEGRATIVE/HOLISTIC	REDUCTIONIST
CLUSTERING	DISECTING
SUBSUMING	FOCUSING
SPECIFIC TO GENERAL	GENERAL TO SPECIFIC
[ADDRESS]	[CONTENT]
JUXTAPOSITIONAL	ISOLATIONAL
[SENSITIVE]	[PRINCIPLED]
SYSTEM ORIENTIED/ORGANIC	CELLULAR
LOOKS AT POTENTIALS	LOOKS AT EXISTENTIALS
LOOKS FOR ALTERNATIVES	LOOKS FOR REFINEMENTS
BRAIN STORMING	DECISION MAKING
SEEKS COMPLETION	SEEKS PERFECTION
DEVELOP TOOLS	DEVELOP SKILLS
ONE SHOT	REPETITIVE
SEEKS MEANING	SEEKS EXPLANATION
[UNDERSTANDING IS MEANING AND EXPLANATION]	
NETWORKS	CELLS/NODES
FOCUS ON RELATIONS	FOCUS ON ENTITIES

==========

BEYOND YIN/YANG THERE IS ITERATION OF YIN/YANG AND THERE IS "ORTHOGONAL JUXTAPOSITION" (WHICH IS NEITHER STRICTLY YIN OR YANG). ORTHOGONAL JUXTAPOSING IS THE CREATION OF QUADRIC DIAGRAMS. THE ATTRIBUTES THAT ARE CLOSE IN MEANING GIVE LITTLE OF INTEREST IN A QUADRIC JUXTAPOSITION, WHEREAS THE ATTRIBUTES THAT ARE REALLY DIFFERENT LEAD TO INSIGHTFUL DIAGONALS.

Brightening (YIN)
- Diffusing
- stimulating ~~Emptying~~
- Increasing field
- Remembering ?

Darkening (YANG)
- focusing
- Calming
- narrowing field
- anticipative

ŏ physical

ĕ spiritual

YIN
- passive
- receptive
- self-referential
- contemplative
- multi-leveled
- relating
- sensitive/open
- ~~introspective~~

YANG
- active
- initiating
- objective
- one-level
- meditative: centering
- isolated
- closed
- introspective

ō horizontal YIN/YANG i.e. one level

e Vertical Multilevel YIN/YANG

A COGNITIVE MANIFESTO

The critical tasks at hand are:

To detect the limits of human perception and cognition.
To identify the distortions and biases implicit in our perceptions.
Distortions are physical and biological [hardware]
Biases are cultural and societal [software]
The psychological is both hardware and software.
To identify the distortions and biases in our modes of thinking and reasoning.
Both those that are hardware and those that are software
Both those that are self deceptive and those implanted by spin masters.
To identify the issues underlying the visible issues.
To design and create alternatives for existing structures and processes.
And
To develop procedures to implement the above.

To liberate ourselves from all dogmas
From those of our religions, cultures, and traditions
From nationalism, racism, sexism, and all us/them isms.
From fundamentalism, scientism, and selective skepticism

To allow all alternatives to be on the table.
To develop evolving criteria for significating and prioritorizing what is on the table.
To develop criteria for developing the criteria.

To alternate specific to general with general to specific.[bottom up with top down]
To periodically update, upgrade, and recycle all knowledge.
To ultimately shred knowledge when correction is not possible.
[cf bio-extinctions]

To permit Brahman
To allow for the concept of truth, but hold that whatever we know is not truth, but at best only a special case.
To seek the totality of pictures of the cosmos, not declare one to be the whole.
If absolutes are needed, let them be subjective not objective.
Let them be to commitment, to courage, and to compassion.

FUTRTHNK.WPD October 19, 2006

FUTURE THINK

Version 2

1. Four value and probabilistic logics
   Plus logic as a function of time

2. Synthesis replacing Eristics
   Contexts disabling Disputes, Search replacing Fight

3. The Middle Way: Convergence | Divergence balance, Diversity treasured not just tolerated
   Plures ex uno | E pluribus unum, Ecology replacing Sovereignty

4. Alternative multi-parameter infrastructures and schemata
   Both contiguous-continuous and discontiguous-discontinuous

5. Consistent and Coherent sub-domains and zones. "Everything is a special case"
   Beyond monolatry, no one picture, no universals

6. Priority of the diachronic over the synchronic
   Control of "width of now"

7. Availability of both isomorphic and auric semiotics
   Need for both precise and vague representations, both equations and poetry

8. Connectivity by Abstraction rather than Generalization
   Multi-level connectivity vs single level connectivity

9. Engage Two level problems on both levels: Prevention of disease and cure of disease.
   Poverty and the poor, Terrorism and terrorists, Set and elements

10. The recognition of quasi-life and pseudo-life.
    Institutions and Organizations as quasi-life forms, Storms as pseudo-life forms

11. The species of randomness and complexity; Gauss vs. Poisson.

12. A special matroshka: Eratosthenes, Aristarchus, Bruno, Digges, Wright, Kant, Borges

13. Metaphors: Cosmology and Architecture.

14. The ultimate dialectics: departure and return; syntheses and fragmentation;

15. The Divine Dialectic: the creation and recreation of man and God.

TRUEFALS#.WPG

A TRUE-FALSE TEST September 1, 1995 #52

1. Is the following sentence true or false?

Their are two errors in this sentense.

2. Is the following sentence true or false?

Their are three errors in this sentense.

3. Is the following sentence true or false?

Their are four errors in this sentense.

The first sentence is clearly true. The third sentence is clearly false.

It is the second sentence that is ambiguous. It may be interpreted in two ways. There are two spelling errors in sentence 2. The sentence says that there are three errors therefore the sentence is false. However, saying that there are three errors when there are only two is itself an error, therefore there are three errors and the sentence is true.

If errors are restricted to content, such as spelling, then sentence 2 is false. If meaning is also included, and two levels are considered, the level of content and the level of meaning, then sentence 2 becomes true.

We have here an example of a statement that is both true and false, depending on how it is viewed. Such propositions arise when levels or classes are involved. From this it follows that Aristotle's logic which is based on the Law of the Excluded Middle, viz, every proposition is either true or false, is limited to one level discussions. Aristotle's logic is a "horizontal logic" and when the vertical is present a different logic is required.

In a logic which can include the vertical, i.e. multiple levels, an operator is required that corresponds to the horizontal operator, NOT. Maybe this is the operator NO, or possibly the Zen MU, if taken as an operator.

MISC B490

NEWTHINK.WS4 DISK: ESSAYS1 03/04/88

NEW IDEAS AND CONCEPTS EFFECTING A WORLDVIEW CHANGE

FACETISM: EVERYTHING IS A SPECIAL CASE

PERSPECTIVISM von BERTALANFY

MULTI-VALENCY JENCKS

MORPHOLOGY ZWICKY

ALL SOLUTIONS, NOT ONE

MORPHOLOGY is an alternative to generalization. Whereas generalization seeks through abstraction to find commonalities which extend throughout the set of considered systems, MORPHOLOGY seeks to organize the set of considered systems through parametric linkages which may take on discrete or continuous values. MORPHOLOGY thus is operating in accord with facetism.

Generalization, through pruning and truncating operations, strives to build monistic structures while MORPHOLOGY seeks to generate as many alternatives as possible. The MORPHOLOGIST is the antithesis of the Grand Inquisitor.

GAME THEORY:WINNING ISN'T EVERYTHING von NEUMANN

NON-ZERO SUM GAMES

COOPERATION/COMPETITION AXELROD

GENERAL SYSTEMS THEORY von BERTALANFY

SYSTEMS ALLOMETRY: JUXTAPOSITION TRONCALE

Systems Allometry demonstrates that some empirically based formulas or regularities persist across many levels of real systems formerly thought to be entirely separate from each other. These regular relationships could not have been discovered by the conventional sciences since no one of them could or would have compared data across all of the others.

NETWORKS

NODES,LINKS,TRAFFIC,TOPOLOGY WILSON

Nodes we call ENTITIES, they are generally nouns.

Links we call RELATIONSHIPS, they are verbs or adverbs.

But all is changing, so there is PROCESS implemented by TRAFFIC, which is stored in NODES and flows in LINKS. TRAFFIC is the essence of FORCE.

There is also TOPOLOGY which is of two sorts: First, is the topology of the network itself, planar, spherical, toroidal, etc. and Second, there is the topology of the NODE which is concerned with the fraction of 4 pi given to the input and output LINKS. For example, for a star the fraction is unity, with a city the fraction involves the number of roads coming into the city and their capacities/(4 pi) The NODE/LINK world models the material or physcial world.

NODES/LINKS or ENTITIES/RELATIONSHIPS should be thought

SCRAPS 90

NEWTHINK.WP6

NEW THINK

CONCEPTS [META-INJUNCTIONS]	VALUES [INJUNCTIONS]
RECIPE --> COSMOS	PRACTICE GANDHIAN GLASNOST
NODE/LINK/TRAFFIC/TOPOLOGY	'FRANCHISE' ALL OPERATIONS
BOOTSTRAP/SPACE STATION	INCLUDE SUNSET CLAUSES
FACETISM	HOLD ALL BEINGS IN REVERENCE
MORPHOLOGY: ALL NOT ONE	DEVELOP DON'T DISSEMINATE
HIERARCHY: THE VERTICAL	ITERATE DON'T REPEAT

HERE/NOW VS EVERYWHERE/NOWHERE
MINIMUM REDUNDANCY IS SET BY REPAIRABILITY NOT BY LOAD
SELF REFERENCE

APHORISMS
EVERYTHING IS A SPECIAL CASE

~

ITEM	TRINITIES [THE THREE JEWELS]
JAIN	RIGHT FAITH, RIGHT KNOWLEDGE, RIGHT CONDUCT
	Note: Jaina maps onto Cybernetics
BUDDHIST	BUDDHA, SANGYA, DHARMA
HINDU	BRAHMA (CREATOR), VISHNU (PRESERVER), MAHESA (DESTROYER)
CHRISTIAN 1.	FATHER, SON, HOLY SPIRIT
2.	GOD, THE BIBLE, THE CHURCH
3.	THE TRANSCENDANT, THE CHRIST, THE IMMANENT

GST1.WPD July 24, 2006

NOVTHINK.WS4 DISK ESSAYS1 BACKUP JUNE 13, 1988
REVISED 06/14/88 COGITANS

Donna points out a difference between von Bertalanfy's General System Theory and J.G. Bennett's Systematics: The approach of General System Theory is the search for commonalities which occur on one or more levels of abstraction between subject systems. For example, the star and the city, or Newton's moon and apple. Bennett's Systematics approach, on the other hand, represents a system by selecting a framework or template from a pre- constructed set of frameworks each of which parameterize a system. The members of the set are characterized by certain general attributes, such as the attributes of the natural numbers. For example, cybernetic or control systems, such as Jung's psychological functions, all share attributes of a four- fold framework. Actually G.S.T. and Systematics are not so much different approaches as steps in a sequence of operations. G.S.T. performs the step of establishing that two (or more) given systems may share the same abstract representations. Systematics performs the step of characterizing a system by identifying it with the best framework taken from a set of pre-established "canonical" frameworks. Which of these steps is first depends on the whether suitable reference frameworks pre-exist in the framework set.

A third step to complete the representation of systems is to imbed the frameworks of the canonical set in a system space. The Systematics approach has so far identified 12 or so frameworks associated with the natural numbers. In order to imbed this set into a system space the parameters indigenous to each framework must be used to isolate meta-parameters which can define the dimensions of the system space. Thus systems possessing commonalities, within the G.S.T. meaning, would lie in the same Hausdorf neighborhoods of the system space. Such a system space is similar to the Hamming spaces of coding theory, or to what has been termed cognition or information space.

The operations in characterizing systems are thus: 1) Identify commonalities between systems [G.S.T.]; 2) Identify systems with their proper characterizing framework [Systematics], (A step which may preceed step one); 3) Construct a "meta-framework" or system space relating the various canonical frameworks; 4) Compare and contrast systems on the basis of their locations in the system space; 5) Steps consisting of iterations of the above four. In step one we use the cognitive operation of clustering, in step two we identify or label the clusters by associating them with, or mapping them onto, a prescribed set of previously designated frameworks. In step three, the structuring of the system space, we are in effect creating a "system grammar" or a "system algebra". It is to be emphasized that the entire process must be iterated. There is no assurance that the set of cononical frameworks is ever complete or optimum. It is therefore subject to continual revision with the consequence that the system space itself is also incomplete and subject to iterative updating.

The fundamental cognitive operations involved in the algorithm are clustering, differentiation, structuring and iteration. Detailed operations include collecting (making laundry lists), placing in juxtaposition (comparing and contrasting, i.e. looking for commonalities and/or differences), sorting including filtering, representing or symbolizing, ordering and more complex operations of structuring.

It is interesting that the creation of programming languages has advanced our analysis of epistemological process, such as the one described here, more in thirty years than has been achieved in 30 centuries. This is largely becaused we have been forced into the self-referential task of examining what we are doing when we think in order to communicate it to a computer. It has been said many times that we can automate anything we can articulate. Wherever we can describe our thinking with sufficient precision to "franchise" it, we can then delegate to the computer.

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An iteration on the above ideas:

Consider the concept of ordering. We may, for example, order a list by "sorting" it, which in usual computer parlance means to place the list in ascending or descending alphabectial (or ASCII) order. The important point to note here is that before we can perform any ordering operation, the particular framework that corresponds to that order must pre-exist. Hence all of the structuring and ordering of which we are capable depends on the set of frameworks or organizing schemata which are available to us. Hence, the morphology of organizing schemata becomes a fundamental epistemological tool. Bennett's set of frameworks not only extends the set of available frameworks, but also self- references or makes visible those which have been commonly available.

From this comes the basic dichotomy (or possibly later the basic set of levels), of systems and frameworks. [It is interesting to compare this dichotomy with the dichotomy of particles and cells in statistical mechanics or combinatorial theory.] Returning to the beginning, before the commonalities of systems according to the G.S.T. approach can be ascertained, some set of system parameters must be at hand. While we may readily be able to perceive that A is like B in some respect or that A differs from B in some respect, the epistemological challenge is to articulate the parameters involved in the likeness and difference. Such a set of parameters is itself an organizing schema, albeit of a primitive sort. Thus our fundamental cognitive operations of association and differentiation depend on some pre-existing frameworks or set of recognizable parameters. Systematics is thus a hidden prerequisite to G.S.T. The presence of iteration again becomes visible. We may conclude that our thinking exists at some distance down a long sequence of iterations of certain cognitive operations. Since the order in which these operations are applied at any point leads to a somewhat different subsequent sequence, the path of our thinking is like our biological form itself, evolved in a series of choices, branches in the Tree of Life. [At this point we suspect the existence of four basic cognitive operations, corresponding to the four basic nucleotides.

LOG

NEWTHPRO.WS4 DISK: ESSAYS1 03/04/88

PROLOGUE TO "NEW THINK"

Rudolf Steiner has said that before the present era, several centuries before the birth of Christ, men did not and could not think in the same way we do today. This seems a little hard to believe, because evidence indicates that humans in those days bore no appreciable anatomical or physiological differences from us. However, when we note the major chasms between the ways various peoples living today think, we must conclude Steiner was right, not because of differences in "hardware" but because of differences in "software".

Although background and education certainly influence our mode of thinking, different modes of thought seem to stem more from worldviews, religions, and the rules of the game we play by, than from nationality, race, class or sex. A cogent example of this was given by the late Richard Feynman while serving on the Challenger disaster committee. After days of conflicting testimony from various breeds of experts concerning whether the cause of the failure could lay in the rubber gaskets, Feynman took a sample of the gasket, ordered a ~~glass of ice water~~ glass of ice water, immersed the sample for a few seconds, then crumbled it with his fingers. This derailed some of the testimony, but did not carry sufficient weight to overide the premise certain officials wanted the committee to conclude. Feynman had to submit a one man minority report in which he remarked on a very fundamental flaw in the way our society thinks. Those who, in their occupations, operate with the natural world, obeying the laws of chemistry and physics, and those who, in their occupations, operate in the political world, obeying the laws of competitive funding and public relations, cannot interface with one another without integrity on one side or the other being compromised. In other words our political reality has evolved to where its rules of the game no longer pay heed to the rules of the natural order in which the game is imbedded. The game exists and persists on borrowed time.

It is indeed distressing to witness the modes of thought of those considered to be mankind's leaders (and also of would be leaders). With but few exceptions, those making major decisions for the world, invalidated themselves for their jobs by their modes of thinking. Admittedly there cannot be a new mode of thought until new tools for thinking are available. But many new tools are now available. Einstein said that 'Everything has changed but our way of thinking'. There is no longer any excuse to delay further a proper response to his challenge.

OLDTHINK.WS4 DISK: ESSAYS1 03/05/88

This year, being an election year, there are many excellent opportunities to study pathological thinking. Flawed thinking assumes several forms, but can be classified as possessing two major categories: intentional or ignorant, criminal or stupid. Most hold knaves to be the greater evil, but some such as Metternich, hold the fool to be the greated menace: "It was worse than a crime it was a blunder". Even in a world without any bad guys, the inherent stupidity, ignorance and naivety of the good guys can do us in.

Sir Francis Bacon in his famous Novum Organum published in 1620, organized many of the pitfalls implicit in human thinking into four categories he called 'idols'.

Idols of the Tribe:

These have to do with those attributes of our perceiving and thinking which are bio-rooted and common to all. These involve the limits, filters, and distortions of our senses which "...bear reference to man, not to the universe".

Idols of the Den:

The distortions and flaws peculiar to the individual, in which we all differ. These are due to our background, training, education. They are our personal idiosyncrasies.

Idols of the Market:

The limitations and distortions imposed on us by language, the inadequacies and miscommunications of words. They "lead mankind into vain and innumerable controversies and fallacies".

Idols of the Theater:

The distortions, slants, biases imposed by our dogmas, ideologies, and all to which we give implicit credence. The plays we act in, the games we play in are confused with reality, "...creating fictitious and theatrical worlds".

[cf. Feynman and the Challenger Disaster Committee. NEWTHPRO.WS4]

Idols of the Theater are rooted in our belief systems. An incorrect belief system in time just does not work, whereas a fixed or closed belief system leads to stagnation and depression. But all belief systems are either wrong, or the contexts change, causing them, sooner or later, to become ineffective. So we have no choice, we either change or become dysfunctional.

Although Novum Organum and the Idols appeared in 1620, even today few have been able to perceive their own entrapments in the Idols. We like to think if we know about a trap we will be able to avoid it [the Major Simons Effect], but when the trap involves something intimately self-referential we refuse to see it.

SOME OF BACON'S IDOLS OF THE TRIBE:

o We suppose more order and equality than exists. We smooth and ignore irregularities.
o Once a proposition has been accepted everything else is forced to add fresh support and confirmation. We reject what does not conform with our first conclusion, we observe the cases of fulfillment, pass over those of failure though they be much more common.

o Human understanding is more excited by the affirmative than by the negative. But in establishing any valid axiom, the negative is the more powerful. [cf. Karl Popper]

o Human understanding is most excited by that which strikes and enters the mind suddenly. [cf. frog boiling and the definition of information]

o Final causes (goals) are the mark of immaturity.

o Our findings are tinctured by our preferences [and interests].

o By far the greatest impediment and aberration of human understanding proceeds from dullness, incompetence, and errors of the senses. The sense of sight dominates our world, consequently we give no weight to the invisible.

o We suppose that which really fluctuates to be fixed. [pulsars]

o It is better to disect than to abstract [science vav math]

o Forms are a fiction of the mind.

SOME OF BACON'S IDOLS OF THE DEN

o Some primarily observe differences, others resemblances

o Some love antiquity, others novelty

o Some focus on particulars, others on generalities

SOME OF BACON'S IDOLS OF THE THEATER

o Sophistics Aristotle corrupted natural philosophy by logic.
Empirics Alchemists discours on everything in terms of their experiments. or Building a worldview only on the Book of Genesis.
Superstitions

o The disputatious school entraps the understanding;

the poetical school flatters it.

o Those who decide hastily, render knowledge absolutist and dictatorial; those who decide slowly introduce skepticism. Authoritarianism subdues the understanding; Skepticism enervates it.

SINCE BACON

* With the unknown, one is confronted with danger, discomfort and worry. The first instinct is to abolish these painful sensations. So the First Principle: Any explanation is better than none.

The search for causes is thus conditioned by and excited by the feeling of fear. The question, "Why?" is not pursued for its own sake, but to find a certain kind of answer. An answer that is pacifing, tranquilizing and soothing.

Friedrich Nietzche in "The Twilight of the Idols"
Quoted by R.A.Wilson in "The New Inquisitors"

DEVICES THAT KEEP A BELIEF SYSTEM CLOSED (cf COGNITIVE THERAPY)

* All or nothing thinking

* Over generalization

* Denial and other mental filters

* Emotional reasoning

* Automatic thoughts

CURRENT IDEAS LEADING TO ILLUSION, SELF-DECEPTION, HYPOCRACY, DISEASE

COLLECTIVE AND PERSONAL

NOT INVENTED HERE
LABELISM
ONE SET OF RULES FOR ME, ONE FOR YOU
MASTER RACE ELITISM
FINALISTIC LOGIC
NEED FOR AN ENEMY
IOD FEEDBACK
ACTION AT A DISTANCE

MIXING LEVELS
JUSTIFICATION FOR NON-ACCOUNTABILITY
ALL OR NOTHING THINKING
OVER GENERALIZATION
DENIAL, MENTAL FILTERS
MAGNIFICATION/MINIMIZATION~

Assuming what is valid locally, here and now, is valid universally

NEWTHINK.WS4 DISK: ESSAYS1 03/04/88

NEW IDEAS AND CONCEPTS EFFECTING A WORLDVIEW CHANGE

FACETISM: EVERYTHING IS A SPECIAL CASE

PERSPECTIVISM von BERTALANFY

MULTI-VALENCY JENCKS

MORPHOLOGY ZWICKY

ALL SOLUTIONS, NOT ONE

MORPHOLOGY is an alternative to generalization. Whereas generalization seeks through abstraction to find commonalities which extend throughout the set of considered systems, MORPHOLOGY seeks to organize the set of considered systems through parametric linkages which may take on discrete or continuous values. MORPHOLOGY thus is operating in accord with facetism.

Generalization, through pruning and truncating operations, strives to build monistic structures while MORPHOLOGY seeks to generate as many alternatives as possible. The MORPHOLOGIST is the antithesis of the Grand Inquisitor.

GAME THEORY:WINNING ISN'T EVERYTHING von NEUMANN

NON-ZERO SUM GAMES

COOPERATION/COMPETITION AXELROD

GENERAL SYSTEMS THEORY von BERTALANFY

SYSTEMS ALLOMETRY: JUXTAPOSITION TRONCALE

Systems Allometry demonstrates that some empirically based formulas or regularities persist across many levels of real systems formerly thought to be entirely separate from each other. These regular relationships could not have been discovered by the conventional sciences since no one of them could or would have compared data across all of the others.

NETWORKS

NODES,LINKS,TRAFFIC,TOPOLOGY WILSON

Nodes we call ENTITIES, they are generally nouns.

Links we call RELATIONSHIPS, they are verbs or adverbs.

But all is changing, so there is PROCESS implemented by TRAFFIC, which is stored in NODES and flows in LINKS. TRAFFIC is the essence of FORCE.

There is also TOPOLOGY which is of two sorts: First, is the topology of the network itself, planar, spherical, toroidal, etc. and Second, there is the topology of the NODE which is concerned with the fraction of 4 pi given to the input and output LINKS. For example, for a star the fraction is unity, with a city the fraction involves the number of roads coming into the city and their capacities/(4 pi) The NODE/LINK world models the material or physcial world.

NODES/LINKS or ENTITIES/RELATIONSHIPS should be thought of as duals in the sense of projective geometry. We are an entity oriented species, but relationships, though invisible, are just as real and probably more important than entities.

BOOTSTRAP COGNITION: ALL REASONING IS CIRCULAR

S-MATRIX THEORY CHEW

Present logical and physcial theories resemble earth based architecture. There is always a foundation, axioms, assumptions, PRIMARIES. BOOTSTRAP theories and models resemble

space stations, there is no foundation. Any part may be taken initially and the rest connected to it. There are no primaries, only a self-consistent whole. However, there may be structures resembling continents, and others resembling islands. But no structure, continent or island,is "valid" until it possesses a critical mass. Two or three pieces of a jigsaw puzzle though they may fit together, may not form part of a picture. [Meta-Epistemology]

SELF-REFERENCE HOFSTADTER
- SELF-SIMILARITY
- SELF ORGANIZATION
- FRACTALS MANDELBROT
- MACROS
- ITERATION/REPETITION
- CONSCIOUSNESS
- REPRESENTATION
  - LABELING BROWN

HIERARCHY
- THE VERTICAL
- CONTROL HIERARCHIES, CYBERNETICS
- MODULAR HIERARCHIES
- REFERENCE HIERARCHIES
- ITERATIVE HIERARCHIES, HUM

ALGORITHMS --> STRUCTURE
- PROCESS/GOAL
- GAME OF LIFE CONRAD
- MANDELBROT SET

HOLOGRAPHICS
- EVERYTHING INTERDEPENDENT
- ECOLOGY, REVERENCE FOR LIFE

CRITICAL MASS
- 100th MONKEY

ENERGY,INFORMATION,ENTROPY
- SECOND LAW OF THERMODYNAMICS
- NON-EQUILIBRIUM MECHANICS PRIGOGINE

QUANTUM REALITY
- EPR, BELL'S INEQUALITY
- COPENHAGEN INTERPRETATION BOHR
- PHYSICAL,MATERIAL vav INFORMATIONAL,SPIRITUAL
- EVERYWHERE/NOWHERE vav HERE/THERE
- ALWAYS/NEVER vav NOW/THEN

TIME

MORPHOLOGY OF CHANGE
- RITES OF PASSAGE
- EYE OF NEEDLE/RADIANT

TEMPORAL PATTERNS
- DEPARTURE AND RETURN
- DIALECTICS
- DYNAMIC LOGIC, OSCILLATION BATESON
- PERI,DIA,ORTHO CAUSALITY

DECISION SCIENCE
- BRAINSTORMING/EVALUATION
- OPTION SPACE
- NON DELEGATION OF SIGNIFICATION
- THE INTERESTING, THE IMPORTANT, THE VALID, THE TRUE

PARADOX
- RUSSELL,WHITEHEAD
- G. SPENCER BROWN

LIMITS
- GODEL'S THEOREM
- SCHWARTZSCHILD'S LIMIT
- VELOCITY OF LIGHT
- Uncertainty Principle

COMMUNITY
- NETWORKS
- MULTI-LEVELED
- MODE OF CHANGE

SPACE

EPISTEMOLOGY/ONTOLOGY

SOME THOUGHTS ON EDUCATION

Our word **Education** derives from the Latin meaning to **lead out**, to lead out into wider worlds than could possibly be experienced in one lifetime. In the Soviet Union the word for education was Опраживане, meaning **fit to the form.** It seems that 'fitting to the form' is what education has also become here. No longer do we want to develop our young so that they may bring their unique gift to us. Rather we want to train cultural cogs to fit into the forms that the system has established. Some of these forms are menial, others are top professional, but all are rigid forms. No one is being taught those skills that allow seeing out of the box. We get out of the box only when a rare genius shows up who introduces some novel concept. And most such geniuses have been at odds with the institutions of inculcation.

With data and information [as distinguished from knowledge] doubling every 20 years, there can no longer be any 'Renaissance Men'. We have been forced to recognize that all we humans have limited information processing capacities. Our cultural solution to this limitation has been the compartmentalization of knowledge with individuals specializing in various disciplines. We have all become specialists and increasingly have become only sub-specialists. But when there remain none who can see the big picture then there no longer is a big picture. Our immediate perspective becomes a surrogate for the whole. The result is competitive divisiveness struggling over who has the right to label their specific agenda the "theory of everything".

But there is an alternative remedy to the limits of our information processing capacities. Instead of slicing knowledge into disciplines, there is a set of comprehensive underlying principles that span many disciplines whose learning and mastery is not beyond our limited capacities. If instead of compartmentalization, the path of education were toward mastery of universal principles, applicable over broad areas, then not only could people so educated be more equipped to master specialties, but the image of the big picture would return. But such an approach to education has been labeled "elitist". It is not for everyone, in fact it is not even for your quotidian PhD. I choose to disagree. I feel that the only type of educated person who is equipped for true democracy is one is who has developed the intellectual capacity and sensitivity to recognize the patterns of universal principles as manifested in the every day experiences and activities of life.

But how do we develop such an education? Looking back to a time when education was actually vectored toward detecting and exploring a big picture, we note the then curriculum. The classical education consisted of the Trivium: Grammar, Rhetoric, Logic [leading to a B.A.] and the Quadrivium (cross roads in Latin): Arithmetic, Geometry, Music, Astronomy [leading to a M.A.] Today, to capture general principles, we would modify the classical curriculum, perhaps as follows: Trivium: Linguistics, Psychology, Comparative Religions. And for the Quadrivium: Mathematics, Music, Biology (evolution and ecology), History. Studies of these topics should give an introduction to sufficient general principles to facilitate their recognition and articulation in other fields.

Ivan Illich then went onto to be vice rector of the Catholic University of Ponce in Puerto Rico. However, he spent only four years there, being forced out of the university in 1960 because of his opposition to the then Bishop of Ponce's forbidding of Catholics to vote for Governor Luis Munoz Marin (because of his advocacy of state-sponsored birth control). Illich founded the Centre for Intercultural Formation (initially at Fordham University) to train American missionaries for work in Latin America. While still committed to the Church, Ivan Illich was deeply opposed to Pope John XXIII's 1960 call for north American missionaries to 'modernize' the Latin American Church. He wanted missionaries to question their activities, learn Spanish, to recognize and appreciate the limitations of their own (cultural) experiences, and 'develop assumptions that would allow them to assume their duties as self-proclaimed adult educators with humility and respect' (Smith and Smith 1994: 435).

From the start he wanted the institution to be based in Latin America - and after walking and hitchhiking several thousand miles he decided on Cuernavaca, Mexico. With the help of Feodora Stancioff and Brother Gerry Morris he set up shop. The Centre was renamed Centre for Intercultural Documentation (CIDOC) and provided an opportunity for several hundred missionaries each year to join, in Ivan Illich's words, 'a free club for the search of surprise, a place where people go who want to have help in redefining their questions rather than completing the answers they have gotten' (quoted in Smith and Smith 1994: 435). The critical and questioning stance of the Centre, and its freewheeling ways of work in began to cause some concern amongst key elements of the Catholic hierarchy. Illich was not one to mince his words:

> Upon the opening of our centre I stated two of the purposes of our undertaking. The first was to help diminish the damage threatened by the papal order. Through our educational programme for missionaries we intended to challenge them to face reality and themselves, and either refuse their assignments or - if they accepted - to be a little bit less unprepared. Secondly, we wanted to gather sufficient influence among the decision-making bodies of mission sponsoring agencies to dissuade them from implementing [Pope John XIII's] plan. (Illich 1973b: 47-8)

Ivan Illich was ordered by the Vatican to leave CIDOC, but he managed to hold out - eventually resigning all offices and church salaries, and then leaving the priesthood in 1969. The Centre had broadened its appeal considerably - and became known for explorations of the many the themes that have become identified with Illich.

Illich's concerns around the negative impact of schooling hit a chord - and he was much in demand as a speaker. His books, The Celebration of Awareness and Deschooling Society brought his thinking to a much wider audience - as did the work of CIDOC colleagues such as Everett Reimer (1971). His chronicling of the negative effects of schools and his development of a critique of the 'radical monopoly' of the dominant technologies of education in Deschooling Society (1973) echoed concerns held well beyond libertarian and anarchist circles. He went on to

apply his critique to energy consumption (Energy and Equity - 1974), and memorably to medical treatment (in Medical Nemesis - 1976). In Tools for Conviviality (1975), Illich provided a more general exploration of his concerns and critique and offered some possible standards by which to judge 'development' (with an emphasis on mutuality, human-scale technology etc.). Throughout he infused his work with an ecological understanding.
Later work and life

Interest in his ideas within education began to wane. Invitations to speak and to write slackened, and as the numbers of missionaries headed for Latin America fell away, CIDOC began to fade. Illich's thinking did not resonate with dominant mood in the discourses of northern education systems. At a time when there was increasing centralized control, an emphasis on nationalized curricula, and a concern to increase the spread of the bureaucratic accreditation of learning, his advocacy of deinstitutionalization (deschooling) and more convivial forms of education was hardly likely to make much ground.

Ivan Illich's later work ranged across a number of areas - but have generally carried forward the central themes of his earlier work. The pieces in Toward a History of Needs (1978) and Shadow Work (1981) largely look to the economics of scarcity, (i.e. that the predominant dynamic in both 'developed' and 'under-developed' economies lies in the desire to profit through the provision of goods and services in sectors where there is a 'scarcity, rather than the wish to share subsistence). Gender (1982) looks to the social experiences of female/male complementarity. In the mid- to late 1980s Ivan Illich turned to and exploration of literacy practices in ABC: The Alphabetization of the Popular Mind (1988) and in In the Vineyard of the Text (1993).

Ivan Illich had set himself against building up a school of followers (Finger and Asún 2001: 7). However, as Carl Mitcham has argued, his thought and life have had an influence on a small, but close circle of friends (see Ivan Illich Studies below). Representative of what might be called the Illich community of reflection are, for example, Barbara Duden's The Woman Beneath the Skin: A Doctor's Patients in Eighteenth-Century Germany, Wolfgang Sachs' The Development Dictionary: A Guide to Knowledge as Power, Lee Hoinacki's El Camino: Walking to Santiago de Compostela and David Schwartz's Who Cares? Rediscovering Community.

After the 1980s Ivan Illich divided his time between Mexico, the United States, and Germany. Currently he was a Visiting Professor of Philosophy and of Science, Technology,
fter the 1980s Ivan Illich divided his time between Mexico, the United States, and Germany. Currently he was a Visiting Professor of Philosophy and of Science, Technology, and Society at Penn State - and also taught at the University of Bremen. He continued to live frugally and 'opened his doors to collaborators and drop-ins with great generosity, running a practically non-stop educational process which was always celebratory, open-ended and egalitarian' (Todd and La Cecla 2002). He engaged in a 'heroic level of activity' - in the early 1990s he was diagnosed as having cancer. True to his thinking (as expressed, for example, in Medical Nemesis) he insisted on administering his own medication. This was against the advice of his doctors, 'who proposed a largely sedative treatment which would have rendered his work

impossible' (Todd and La Cecla 2002). He was able to finish a history of pain (which will be published in French in 2003).

Ivan Illich died on December 2, 2002.

Institutionalization, expert power, commodification and counterproductivity

As Ian Lister commented in his introduction to After Deschooling, What? (Illich 1976: 6), the central, coherent feature of Ivan Illich's work on deschooling is a critique of institutions and professionals - and the way in which they contribute to dehumanization. '[I]nstitutions create the needs and control their satisfaction, and, by so doing, turn the human being and her or his creativity into objects' (Finger and Asún 2001: 10). Ivan Illich's anti-institutional argument can be said to have four aspects (op. cit.):

A critique of the process of institutionalization. Modern societies appear to create more and more institutions - and great swathes of the way we live our lives become institutionalized. 'This process undermines people - it diminishes their confidence in themselves, and in their capacity to solve problems... It kills convivial relationships. Finally it colonizes life like a parasite or a cancer that kills creativity' (Finger and Asún 2001: 10).

A critique of experts and expertise. Ivan Illich's critique of experts and professionalization was set out in Disabling Professions (1977a) and in his exploration of the expropriation of health in Medical Nemesis (1975b). The latter book famously began, 'The medical establishment has become a major threat to health' (ibid.: 11). The case against expert systems like modern health care is that they can produce damage which outweigh potential benefits; they obscure the political conditions that render society unhealthy ; and they tend top expropriate the power of individuals to heal themselves and to shape their environment (op. cit.). Finger and Asún (2001: 10) set out some of the elements:

Experts and an expert culture always call for more experts. Experts also have a tendency to cartelize themselves by creating 'institutional barricades' - for example proclaiming themselves gatekeepers, as well as self-selecting themselves. Finally, experts control knowledge production, as they decide what valid and legitimate knowledge is, and how its acquisition is sanctioned.

A critique of commodification. Professionals and the institutions in which they work tend to define an activity, in this case learning, as a commodity (education), 'whose production they monopolize, whose distribution they restrict, and whose price they raise beyond the purse of ordinary people and nowadays, all governments' (Lister in Illich 1976: 8). Ivan Illich put it this way:

Schooling - the production of knowledge, the marketing of knowledge, which is what the school amounts to, draws society into the trap of thinking that knowledge is hygienic, pure, respectable, deodorized, produced by human heads and amassed in stock..... [B]y making school compulsory, [people] are schooled to believe that the self-taught individual is to be discriminated

against; that learning and the growth of cognitive capacity, require a process of consumption of services presented in an industrial, a planned, a professional form;... that learning is a thing rather than an activity. A thing that can be amassed and measured, the possession of which is a measure of the productivity of the individual within the society. That is, of his social value. (quoted by Gajardo 1994: 715)

Learning becomes a commodity, 'and like any commodity that is marketed, it becomes scarce' (Illich 1975: 73). Furthermore, and echoing Marx, Ivan Illich notes the way in which such scarcity is obscured by the different forms that education takes. This is a similar critique to that mounted by Fromm (1979) of the tendency in modern industrial societies to orient toward a 'having mode' - where people focus upon, and organize around the possession of material objects. They, thus, approach learning as a form of acquisition. Knowledge become a possession to be exploited rather than an aspect of being in the world.

The principle of counterproductivity. Finger and Asún (2001: 11) describe this as 'probably Illich's most original contribution'. Counterproductivity is the means by which a fundamentally beneficial process or arrangement is turned into a negative one. 'Once it reaches a certain threshold, the process of institutionalization becomes counterproductive' (op. cit.). It is an idea that Ivan Illich applies to different contexts. For example, with respect to travel he argues that beyond a critical speed, 'no one can save time without forcing another to lose it...[and] motorized vehicles create the remoteness which they alone can shrink' (1974: 42).

The lines of this critique and argument with respect to schooling when set out like this are reasonably clear. But Ivan Illich in his earlier writings tended to 'obscure the essential elements' (Lister 1976: 5). He is 'an intellectual maverick who deals in metaphors and allegories' and those who did not read the related works 'were often confused as to what deschooling was all about' (ibid.: 5-6). A further problem was that, according to Gajardo (1994: 719), Ivan Illich's writings 'were founded essentially on intuition, without any appreciable reference to the results of socio-educational or learning research. His criticism evolves in a theoretical vacuum'. Gajardo goes on to suggest that this may explain the limited acceptance of his educational theories and proposals. However, perhaps the most significant problem with the analysis is the extent to which Illich's critique 'overrated the

possibilities of schools, particularly compared with the influence of families, television and advertising, and job and housing structures' (Lister 1976: 10-11). This was something that Ivan Illich recognized himself when he was later to write of schools as being 'too easy targets' (1976: 42). It may well be that the way in which he presented his critique was taken as condemning the school out of hand (Gajardo 1994: 719). However, as Finger and Asún 2001: 11) have commented,

Illich is not against schools or hospitals as such, but once a certain threshold of institutionalization is reached, schools make people more stupid, while hospitals make them sick. And more generally, beyond a certain threshold of institutionalized expertise, more experts are

counterproductive - they produce the counter effect of what they set out to achieve.

It can be persuasively argued that Ivan Illich 'transgressed a cardinal rule' about what discourses are acceptable within education (Gabbard 1993). He questioned the 'messianic principle' that schools as institutions can educate.

Ivan Illich's critique remains deeply suggestive. While not rigorously linked to data, nor fully located in its theoretical traditions, it does nevertheless draw some important lines for exploration and interrogation; and provides us with some means by which to make judgments about the impact of institutions and experts. The dominance of the school and institutionalized education in our thinking about learning has tended to obscure and undermine other everyday or 'vernacular' forms. We have moved into a period when knowledge has become more commodified (see, for example, Leadbeater's 2000 discussion of the knowledge economy).
Convivial alternatives

I believe that a desirable future depends on our deliberately choosing a life of action over a life of consumption, on our engendering a lifestyle which will enable us to be spontaneous, independent, yet related to each other, rather than maintaining a lifestyle which only allows to make and unmake, produce and consume - a style of life which is merely a way station on the road to the depletion and pollution of the environment. The future depends more upon our choice of institutions which support a life of action than on our developing new ideologies and technologies. (Illich 1973a: 57)

Ivan Illich has argued for the creation of convivial, rather than manipulative institutions. Conviviality involves 'autonomous and creative intercourse among persons, and the intercourse of persons with their environment' (ibid.: 24). In convivial institutions (and the societies they make up) modern technologies serve 'politically interrelated individuals rather than managers'. (Illich 1975: 12). Such institutions are characterized by 'their vocation of service to society, by spontaneous use of and voluntary participation in them by all members of society (Gajardo 1994: 716). In many respects, Ivan Illich is echoing here the arguments of earlier writers like Basil Yeaxlee who recognized the power of association and the importance of local groups and networks in opening up and sustaining learning. However, he takes this a stage further by explicitly advocating new forms of formal educational institutions. He also recognizes that the character of other institutions and arrangements need to be changed if the 'radical monopoly' of schooling is to be overturned.

Learning webs - new formal educational institutions. In Deschooling Society Ivan Illich argued that a good education system should have three purposes: to provide all that want to learn with access to resources at any time in their lives; make it possible for all who want to share knowledge etc. to find those who want to learn it from them; and to create opportunities for those who want to present an issue to the public to make their arguments known (1973a: 78). He suggests that four (possibly even three, he says) distinct channels or learning exchanges could facilitate this. These he calls educational or learning webs.

Exhibit 1: Ivan Illich on learning webs

Educational resources are usually labelled according to educators curricular goals. I propose to do the contrary, to label four different approaches which enable the student to gain access to any educational resource which may help him to define and achieve his own goals:

1. Reference services to educational objects - which facilitate access to things or processes used for formal learning. Some of these things can be reserved for this purpose, stored in libraries, rental agencies, laboratories and showrooms like museums and theatres; others can be in daily use in factories, airports or on farms, but made available to students as apprentices or on off-hours.

2. Skill exchanges - which permit persons to list their skills, the conditions under which they are willing to serve as models for others who want to learn these skills, and the addresses at which they can be reached.

3. Peer-matching - a communications network which permits persons to describe the learning activity in which they wish to engage, in the hope of finding a partner for the inquiry.

4. Reference services to educators-at-large - who can be listed in a directory giving the addresses and self-descriptions of professionals, paraprofessionals and freelances, along with conditions of access to their services. Such educators... could be chosen by polling or consulting their former clients. (Illich 1973a: 81)

Such an approach to educational provision found some enthusiastic proponents within non-formal education (see, for example, the work of Paul Fordham et. al.1979). More recently, such themes have appeared in a somewhat sanitized form in some policy pronouncements around lifelong learning and the so-called learning society. Writers like Leadbeater (2000: 112) have rediscovered Ivan Illich and argued for a partially deschooled society: 'More learning should be done at home, in offices and kitchens, in the contexts where knowledge is deployed to solve problems and to add value to people's lives'. However, there can be a cost in this. The reference to 'adding value' hints at this. As Ivan Illich himself argued, 'educators freed from the restraint of schools could be much more effective and deadly conditioners' (Illich 1975: 74). Without a full realization of the political and ethical dimensions of conviviality, what can happen is not so much de-schooling but re-schooling. The activities of daily life become more deeply penetrated by commodification and the economic and social arrangements it entails. Learning becomes branded (Klein 2001: 87-105) and our social and political processes dominated by the requirements of corporations (Monboit 2001).

Informal education - changing the character of other institutions and formations. Ivan Illich argues for changes to all institutions so that they may be more convivial for learning.

A radical alternative to a schooled society requires not only new formal mechanisms for the

formal acquisition of skills and their educational use. A deschooled society implies a new approach to incidental or informal education.... [W]e must find more ways to learn and teach: the educational qualities of all institutions must increase again. (Illich 1973a: 29-30)

Unfortunately, Ivan Illich does not explore this in any depth - and it has been up to those seeking to encourage more dialogical forms of everyday living to develop an appreciation of what this might mean in practice for educators and policymakers. Ivan Illich's critique of development and his 'call for the creation of a radically new relationship between human beings and their environment' has not played a significant part in the mainstream of policy and practice (Finger and Asún 2001: 14). In recent years one of the strongest arguments for the need to examine the learning potential of institutions has come from those like Peter Senge who have sought to alter the character of business organizations (creating so-called 'learning organizations'). While some of these writers have had a concern with dialogue and organizational forms that are more just, many have not had the sorts of interests and commitments that Ivan Illich described as 'convivial'. In some respects the current interest in social capital (most significantly expressed in the work of Robert Putnam 2000) is more hopeful. The importance of convivial institutions is recognized in the sustaining of community - but social capital, because it is also linked to economic advancement, can be easily co-opted in the service of non-convivial activities (as the involvement of the World Bank in promoting the notion may suggest).

Conclusion

Ivan Illich's concern for conviviality - on the ordering of education, work, and society as a whole in line with human needs, and his call for the 'deprofessionalization' of social relations has provided an important set of ideas upon which educators concerned with mutuality and sociality can draw. His critique of the school and call for the deschooling of society hit a chord with many workers and alternative educators. Further, Ivan Illich's argument for the development of educational webs or networks connected with an interest in 'non-formal' approaches and with experiments in 'free' schooling. Last, his interest in professionalization and the extent to which medical interventions, for example, actually create illness has added to the critique of professions and a concern to interrogate practice by informal educators - especially those in more 'community-oriented' work. As Gajardo (1994: 717) has commented, 'if... we separate Illich's thought from its emotional context, it is interesting to realize how thought-provoking some of his suggestions and proposals are'.

Erich Fromm, in his introduction to Celebration of Awareness (Illich 1973: 11) describes Ivan Illich as follows:

> The author is a man of rare courage, great aliveness, extraordinary erudition and brilliance, and fertile imaginativeness, whose whole thinking is based on his concern for man's unfolding - physically, spiritually and intellectually. The importance of his thoughts... lies in the fact that they have a liberating effect on the mind by showing new possibilities; they make the reader more alive because they open the door that leads out of the prison of routinized, sterile, preconceived notions.

NEWTHNK2.WS4 DISK ESSAYS1 BACKUP JUNE 13, 1988
REVISED 06/14/88

Donna points out a difference between von Bertalanfy's General System Theory and J.G. Bennett's Systematics: The approach of General System Theory is the search for commonalities which occur on one or more levels of abstraction between subject systems. For example, the star and the city, or Newton's moon and apple. Bennett's Systematics approach, on the other hand, represents a system by selecting a *framework* or *template* from a pre-constructed set of frameworks each of which parameterize a system. The members of the set are characterized by certain general attributes, such as the attributes of the natural numbers. For example, cybernetic or control systems, such as Jung's psychological functions, all share attributes of a four-fold framework. Actually G.S.T. and Systematics are not so much different approaches as steps in a sequence of operations. G.S.T. performs the step of establishing that two (or more) given systems may share the same abstract representations. Systematics performs the step of characterizing a system by identifying it with the best framework taken from a set of pre-established "canonical" frameworks. Which of these steps is first depends on the whether suitable reference frameworks pre-exist in the framework set.

A third step to complete the representation of systems is to imbed the frameworks of the canonical set in a system space. The Systematics approach has so far identified 12 or so frameworks associated with the natural numbers. In order to imbed this set into a system space the parameters indigenous to each framework must be used to isolate meta-parameters which can define the dimensions of the system space. Thus systems possessing commonalities, within the G.S.T. meaning, would lie in the same Hausdorf neighborhoods of the system space. Such a system space is similar to the Hamming spaces of coding theory, or to what has been termed cognition or information space.

The operations in characterizing systems are thus: 1) Identify commonalities between systems [G.S.T.]; 2) Identify systems with their proper characterizing framework [Systematics], (A step which may preceed step one); 3) Construct a "meta-framework" or system space relating the various canonical frameworks; 4) Compare and contrast systems on the basis of their locations in the system space; 5) Steps consisting of iterations of the above four. In step one we use the cognitive operation of clustering, in step two we identify or label the clusters by associating them with, or mapping them onto, a prescribed set of previously designated frameworks. In step three, the structuring of the system space, we are in effect creating a "system grammar" or a "system algebra". It is to be emphasized that the entire process must be iterated. There is no assurance that the set of cononical frameworks is ever complete or optimum. It is therefore subject to continual revision with the consequence that the system space itself is also incomplete and subject to iterative updating.

The fundamental cognitive operations involved in the algorithm are clustering, differentiation, structuring and iteration. Detailed operations include collecting (making laundry lists), placing in juxtaposition (comparing and contrasting, i.e. looking for commonalities and/or differences), sorting including filtering, representing or symbolizing, ordering and more complex operations of structuring.

It is interesting that the creation of programming languages has advanced our analysis of epistemological process, such as the one described here, more in thirty years than has been achieved in 30 centuries. This is largely because we have been forced into the self-referential task of examining what we are doing when we think in order to communicate it to a computer. It has been said many times that we can automate anything we can articulate. Wherever we can describe our thinking with sufficient precision to "franchise" it, we can then delegate to the computer.

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An iteration on the above ideas:

Consider the concept of ordering. We may, for example, order a list by "sorting" it, which in usual computer parlance means to place the list in ascending or descending alphabectial (or ASCII) order. The important point to note here is that before we can perform any ordering operation, the particular framework that corresponds to that order must pre-exist. Hence all of the structuring and ordering of which we are capable depends on the set of frameworks or organizing schemata which are available to us. Hence, the morphology of organizing schemata becomes a fundamental epistemological tool. Bennett's set of frameworks not only extends the set of available frameworks, but also self-references or makes visible those which have been commonly available.

From this comes the basic dichotomy (or possibly later the basic set of levels), of systems and frameworks. [It is interesting to compare this dichotomy with the dichotomy of particles and cells in statistical mechanics or combinatorial theory.] Returning to the beginning, before the commonalities of systems according to the G.S.T. approach can be ascertained, some set of system parameters must be at hand. While we may readily be able to perceive that A is like B in some respect or that A differs from B in some respect, the epistemological challenge is to articulate the parameters involved in the likeness and difference. Such a set of parameters is itself an organizing schema, albeit of a primitive sort. Thus our fundamental cognitive operations of association and differentiation depend on some pre-existing frameworks or set of recognizable parameters. Systematics is thus a hidden prerequisite to G.S.T. The presence of iteration again becomes visible. We may conclude that our thinking exists at some distance down a long sequence of iterations of certain cognitive operations. Since the order in which these operations are applied at any point leads to a somewhat different subsequent sequence, the path of our thinking is like our biological form itself, evolved in a series of choices, branches in the Tree of Life. [At this point we suspect the existence of four basic cognitive operations, corresponding to the four basic nucleitides.]

MINDBRN.WP5 DISK ESSAYS1 NOVEMBER 21,1988

MIND AND BRAIN

The relationship of mind and brain is one of the basic mysteries of human existence. There are many models, none provable, some disprovable. But the importance of the mind brain relationship lies in its implications for the nature of man and his meaning in the cosmos. From different models, different conclusions can be drawn on such important questions as how life should be lived and the nature of death.

One Model:
Mind exists in a trans-physical domain whose elements are available to us as picture images, word images (thoughts), injunctive images (values), and control images (archetypes), ... This mind is "tapped" by by various organisms through the medium of a brain. Thus a brain connects mind with a body, intelligence with the physical world, information with matter/energy, software with hardware. We might say that brain incarnates mind into space and time for the domain of mind posseses neither space nor time. Mind is everywhere (and therefore nowhere) and Mind is always (and therefore never). Space and time, and other attributes of the physical world impose limitations on what of Mind can be incarnated or received, such limitations as consistency, logic,...

SOME QUESTIONS (for this or any model)
What are the real monads of Mind? Number? Image? Value? Archetype? ? For the most part they are ineffeble.
Is there one Mind or many?

Another model supposes that there do not exist any diembodied intelligences. Thus mind and brain are in a 1 to 1 correspondence, and if brain dies, as it must, then mind and thought ceases. Certainly sense communication ceases. In this model mind is a product of brain, thoughts are the result of processes taking place in the brain operating on sense data. However, individuals frequently come up with the same thoughts even though these thoughts have never been communicated to them. We conclude that either brain inevitably reaches certain results or (independent discovery) or that communication takes place on a not sense level (diffusion). In the latter case minds can communicate "psychically" or there is a common Mind. If there is but one mind then thought is not of brain origin.

The above discussion says only this: If there exists but one Mind then thought is a property of Mind and incarnated into the physical world per brain. If, on the other hand, there is a one to one correspondence between mind and brain, then thought and what we call mind is the product of brain. The key question then is that of the multiplicity of mind.

Other models invalidate the above consideration. For example, there may exist many minds but they are not associated in a 1:1 manner with brains. A brain may tap in on a particular mind at one time and into another mind at some other time. Or there may be several minds each associated with distinct sets of brains.

COG

INFO1.WP6 April 15, 1995 #30

WHAT IS INFORMATION?

At the present engineers, scientists, philosophers, and the business world are trying to formulate just what information is. All that can be agreed upon at this point is that information is one of the fundamental concept-quantities that has emerged from our experiencing of the world, along with such other fundamental concept-quantities as energy, matter, space, and time. While matter, space and time have been intellectual currency for millenia, the idea of energy was formulated only in the nineteenth century, and information only in the present century.

Currently there are four approaches to the idea of information:

1) One of the first notions concerning information came from Shannon: The amount of information in a message is proportional to its degree of unexpectedness. Casti adds information has to do with the level of surprise. Don says whatever is out of the ordinary. So it seems that according to this approach information has to do with surprise, the unexpected, or what is out of the ordinary.

2) A second approach has to do with choice. The unit of information is the bit or binary choice: The choice between the elements in any mutually exclusive dyadic division, such as between true and false, plus or minus, zero and one.

3) A third approach was derived by the physicist Szilard. He noted that information is like negative entropy. And since entropy is always increasing, information is consequently always decreasing.

4) A fourth approach has to do with the needs of a user. That portion of data that is of use or meaning to a particular person at a particular time is information for that person, for all the rest it is just data.

The foregoing attributes of information emphasize its dynamic nature. They hold that information is never static, it is moving, being sent and received, being created or destroyed. Yet there is a static kind of information, the information

contained in a form or pattern and the information required to generate that form or pattern, DNA/RNA, for example. While the genetic code contains information for living forms, might we not appropriately ask is not the information for inanimate forms-- for crystals, for molecules and atoms-- also stored somewhere? And what about the information stored in books? Is it not just data until it satisfies the dynamic need of some user.?

Whenever we make an observation or a measurement we are creating information, [individual measurements may not result in increased information, but a set of such measurements can], and as a consequence we are also locally decreasing entropy. Since entropy is a measure of disorder, the increase in information leads therefore to increasing order. One of the best definitions of life is that living systems have the ability to locally and temporally decrease entropy. Since information and entropy balance one another, living systems are characterrized by creating information and order in the cosmos. But there seem to be other forces, besides life forces, that also create order.

Observaton and measurement are acts of actualization. And whenever there is actualization, potentiality is decreased. We may model this as viewing potentiality as existing on one level and actuality on another, an observation or measurement transfers information (and possibly some other essence) from the potentiality level to the actual or existential level. (cf David Bohm's two orders) In quantum mechanics actualization results from the collapse of the wave function [J.G.Bennett's *hyparxis*] transforming something that was global into something local.

All potentiality appears to reside in the higher level. In the process of actualization, siphoning to the existential level, do we deplete potentiality or is potentiality renewable?

Some have noted that information is more like light than like matter, having attributes that some associate with the spiritual.

AIA MINIMUM LENGTH OF DESCRIPTION

C&C

INFOAGIN.WP6 November 6, 1997

MORE ON INFORMATION

Beginning with railroads and telegraphs, experience has taught that for a dynamic system to function its information transmissions must be faster that its material movements. Years ago Astrophysicist Jesse Greenstein noted that this seems to be true throughout the universe. Everywhere a system has both slow (dynamical) and fast (informational) components. **Information must move faster than matter.** Astronomer Gustav Stromberg questioned how the interferometric measure of the diameter of a star was possible. Interference must be established between radiation from atoms on the "left" edge of the star and radiation from atoms on the "right" edge of the star. This required a certain phase coherence between the atoms hundreds of thousands of kilometers apart. Whence this coherence? How did the atoms communicate? Signals moving at the velocity of light in many cases would be inadequate to establish coherence. What was the 'fast component' in this case?

Perhaps there may be more than two levels necessary for a structure to exist. (Assuming here that coherence is an essential attribute of all systems and structures). The mechanical or dynamic level operates at speeds up to the velocity of light. One informational level, the electro-magnetic operates at the speed of light. But perhaps there is a third informational level with transmissions at speeds faster than light. (However, another possibility is given by the operation of a computer map. In order to go from one place to another, one does not move screenwise across the map, but zooms out, reducing the entire territory to one screen, then moves a small distance across the screen and then zooms back in to the destination. This covers the distance in a fraction of the time required by one level movement. Of course this multi-level operation could also take the form of atoms on the left edge and atoms on the right edge both taking their drum beat from a common clock on another level.)

We know that energy is transmitted or exchanged only in the present moment. But what about information? Is it possible that information is transmitted and exchanged in the future? If so this poses an intriguing relation between the problems of information exchange and our notions of the nature of time. Levels of scale, rates of 'horizontal' transmission and rates of 'vertical' (between levels) transmission may all be interwoven in a more complex manner than science's one level notion of space-time can incorporate.

Finally, Gregory Bateson said that 'Information is always at the boundaries'. What did he mean by this?

Another aspect of this has been pointed out by Tony Rothman. Only those systems obeying Maxwell-Boltzman statistics are subject to the second law of thermodynamics. Systems obeying other statistics seem to be immune. Maxwell-Boltzman goes with analog, Einstein-Bose and Fermi-Dirac reside in other modes. On the one hand, digital codes may readily be restored, similar in ways to holograms, while the analog, preserved from decay by continual amplification, is always subject to information loss.

But there is also energy/information stored in the relationship, in the link. This energy/information is both static or stored and flowing. Over time the e/i in a relationship can become very rich, like a savings account of large magnitude. When the link is broken, the e/i begins to flow. For one party it can be like a spending spree, very euphoric [the euphoria comes both from the e/i released from the broken link and the flow of e/i into the new configuration.] For the other party the flow is draining the energy from the link, lost and diminished. There is no access to the e/i redeposited in the new bank account. In the case of death when we are drained does this mean that the e/i has been available to the departed one (cf ancient burial of e/i in tombs with kings, etc.) and if we have not lost significant e/i does this mean that there is little for the departed one?

Information is always at boundaries, whether these are boundaries in time, space, or level of abstraction.

Gregory Bateson

9. INFORMATION: THOUGHTS WITHOUT A THINKER

More like light than matter

definitions

Degree of Surprise-- Shannon
Negentropy-- Szilard
Bits and Bytes--
Useful Data-- F(t,x,y,z,person) project
Minimum Length of Description

We begin with a set of experiences, say those that are permitted by our biological structure. Soon some of these are emphasized (usually those with a ~~large~~ smaller repetition rate) which results in the negation of others. This is like a rut in the side of a hill. The future flow of water will choose these existing ruts and develop them into gorges. Which is to say that whatever is selected operates through the Principle of Plenitude, confirming itself and blocking other choices. or as the Law of Hardening puts it, whenever information concerning a particular area is extracted this precludes information being extracted from other areas. That is, SELECTION CREATES INHIBITORS, which is to say that selection destroys access to that which is not selected. This process results in an ever narrowing and increasingly static world.

Another TDMA multiplexing model would have an information vs. energy oscillation occurring at some unknown frequency. Somehow every material form must be continually refreshed by being supplied both energy and information. This view holds that information-energy, time-frequency, and wave-particle are each two sides of a coin. [of how many coins?, one, two, or three?]

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.

September 1, 2007

Energy is transferred only in the instant of the present time. Information, on the other hand, can be transferred over an extended period, even centuries. OR information and energy operate under different species of time. Energy under Newton's time, information under some other form.

CONTIGUOUS/CONTINUOUS VS DIGITAL/DISCRETE

The world is both particulate and fluid. OR of elements and of sets.
Which do we perceive? It depends on resolving power. We perceive humans as discrete, on another level they are a set [fluid like] We perceive matter as con/con but on the quantum level it is particulate or granular. In general, the fluid or con/con nature is invisible and the dig/dis is visible. Forces are fluid but on some level become gravitons or photons.

The structuralists tell us that the fluid is fundamental, while we perceptually experience the particulate. And they go further and infer meta-fluids, [just as there are meta-particles ([eg atoms to molecules, etc)], what we take as different forces are derivative from a more fundamental FORCE.

ON AUTHORITY

Authority is a mental construct. It is a concept that the Chief, the Pope, the Academy,... will be the source of the criteria for my decision making. In this authority is projected. We project authority then place ourselves under it. But projections may be given and they may also be withdrawn. Power is intimately associated with authority. Direct power limits my options for action. The indirect power of authority limits my options through placing mental limits on my option space.

Authority works because each of us as a helpless child had to place ourselves under the authority of our parents to survive. The process becomes habitual. Further the confusion created by a large option space leads us to seek constraints. At times it is a relief to have some one tell us what to do, what not to do. All choice and decision is difficult, correct choice and decision demands maturity.

Authority supports itself by threats to resort to direct power. You will either limit your option space or we will do it for you. However, once the projection of authority is withdrawn, the power behind it quickly errodes. No power can sustain itself for long once its authority has been lost. The first step in revolution and rebellion is the withdrawal of authority. Preceding this is usually loss of respect. i.e. respect is uaually the first aspect of authority to be lost.

Authority should belong to every individual, as with sovereignty according to Thomas Jefferson.

The most powerful authority operating in the world is the authority of the past. This includes established institutions, traditions, customs, and habits. We live in a past oriented society. We hold that the past is this best guide to the future, but this idea is breaking down in our times.

THINKTYPES.WPD March 10, 2006

FOUR SPECIES OF THINKING

SCIENCE APPROACH:

Focus on confirmed facts [confirmed meaning repeating or reproducible by experiment]
Focus on the "IS", what is out there, objective, value free.
[But now being modified by recognizing observers' participation]
True/False, Aristotelean view being replaced by a probabilistic view,
[But allowing Popper falsification]
Skeptical and uncertain, open to modification and correction, never final; If can, then do.
View of others: General unconcern, but toss them a few apples now and then.

LAW APPROACH:

Focus on selected facts [what advances winning the case]
Selection of inputs; control both what is admitted as evidence and who can be a witness.
[Use of ad hominems to discredit witnesses and to disallow inputs]
Interchange sets with subsets and exclude contexts to advance chosen views
Wording of law overruling intent of law, i.e. symbols replace substance.
Homogenize circumstances to subject them to the law.
Stasis oriented, certainty is established by precedence
View of others: They are to be both protected and controlled.

POLITICAL APPROACH:

Focus on images and illusions [What appeals to and entertains the public]
Project infallibility and pseudo certainty using PR, spin, and Orwellisms
Believe in yourself and your agendas, insulate policies from facts and contexts
Power of office allows you to create reality. i.e. "Might makes Right"
[but we have fought wars against "Macht geht vor Recht"]
View of others: The public are sheep to be led and homogenized into lockstep.

FAITH APPROACH:

Focus on the belief system, on its description of the world.
Focus on direction, ignore current position
Have absolute certainty in the correctness of the vision. Wish can subdue reality.
Diversity is dangerous.
["We are the ones, the chosen few, The rest of you are damned,
There is plenty of room in Hell for you, We don't want Heaven crammed.]
View of others: They are unwashed and must either be converted or eliminated.

All of the above justify the use of various cognitive filters, sieves, and nets to select what dots are on their table of discourse. And all of the above restrict inputs because of inherent limited information processing capacity

06-03-11

PART II

Science: {events} → define a law convergence

SOCIETY: Law → herd {events} homogenization

both convergence and homogenization
are for simplification and for power

Science seeks "Theory of Everything"

Law-Pol seek power + control, centralization of

Faith → monotheism

Humanity's drives to ONENESS

While nature → DIVERSITY

Using 2nd Law to fragment "oneness"

New Age - Everything is connected oneness

Is Hierarchy as path to Oneness ? - separation of powers

or solution to protecting diversity, ecology

Some pieces do not fit

one picture, one puzzle
one mystery

MediaThink

The media reports sees everything - but captures nothing

totally synchronic

The Zoom Lens Spectrum

Precision

Zoom into mathematics 1:1 mappings, zero penumbra

High resolving power

Zoom out to poetry, myth, stories

Low resolving power, large penumbra

Big Picture

sends out tentacles to grasp

what has not been captured

but possibly glimpsed

THINKING STYLES

(by profession)

LAW~~YER~~ THINK:
Seek the facts that ~~indicate~~ support a selected ~~direction~~ conclusion.

SCIENTIST THINK: FACT
Seek ~~the~~ a direction ~~that is~~ indicated by selected facts.

POLITICAL THINK:
Ignore the facts, ~~drate~~ push the direction.

SPIN THINK:
Invert the facts, vary the direction.

ORWELL THINK

MILITARY THINK:
Facts overrule any selected direction.

MERCHANT THINK:
Package selected facts ~~with~~ for a profit direction.

CLERGY THINK:
No need of facts, we ~~possess~~ know the direction.

ORTHOGONAL THINK:
Let all the facts seek their own directions. [~~neural~~]

GROUP THINK
Be of one voice, whatever the direction

JOURNALIST THINK
Create synchronic significance [direction]

TEACHER [ACADEMIC] THINK

ALTHNK01.P51 January 26, 1991

ALTERNATE WAYS TO THINK

- LOGICAL THINKING
  The classical mode of western thought first systemized by Aristotle. It forms the basis of mathematical, scientific, and systems thinking, and to some extent is an ingredient of theological and legalistic thought. The concept of proof is unique to this mode of thinking. It begins with postulates, derives consequences by rigorous deductive canons, and posits it conclusions as being proved. Its limitations have been demonstrated by Russell, Whitehead and Gödel.

- ANALYTIC THINKING
  The top-down application of logical thinking.

- SYNTHETIC THINKING
  A bottom-up constructionist approach using such methods as juxtaposition, association, and metatphor. Multi-leveled, but not necessarily Machian.

- PATTERN THINKING
  Consider the overall pattern and even though certain links may be missing, continue to construct a self-reinforcing whole. This type of thinking is exemplified by Sherlock Holmes' approach to solving murder mysteries. It includes such questions as motivations, who stands to gain, to lose. This approach is oftimes used in courts for evidence, but is never to be regarded as constituting proof.

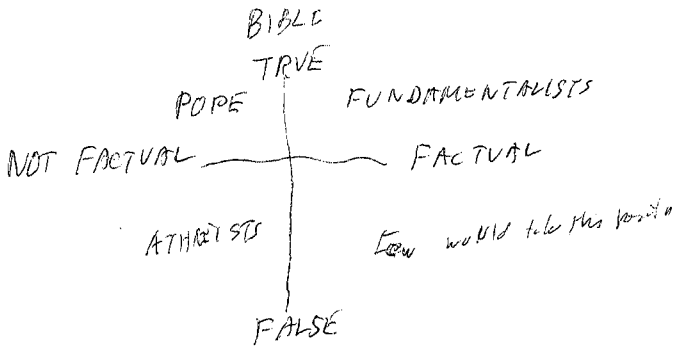
- JUXTAPOSITION THINKING
  Placing items in juxtaposition and reading the space between them. It is useful for investigating possible commonalities, establishing alternate linkages and for synthetic thinking in general. It is an anecdote to associative thinking in that it may generate counter-intuitive or anti-associations. For example, if we generate a set of cards each containing an item and place cards in juxtaposition in various combinations, sometimes hitherto unsuspected commonalities are revealed and in the "space between the cards" we may discover something we did not previously suspect.

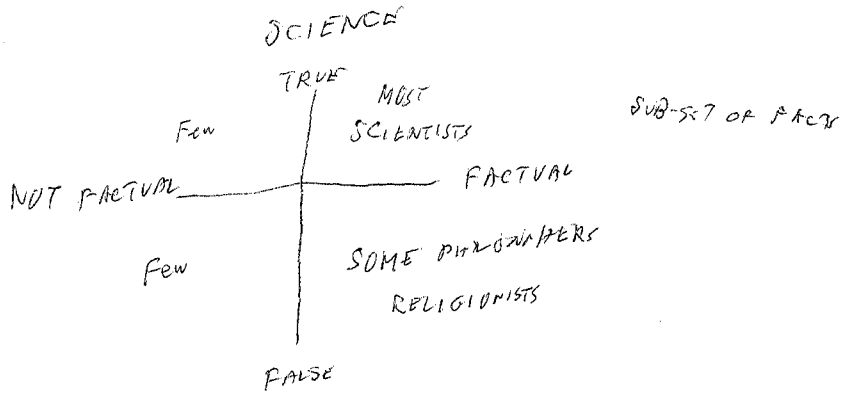
- REDUCTIONIST THINKING
  This approach assumes a bottom-up causality, the properties of the parts determining those of the whole. It is deficient in accounting for the emergence of new properties which arise in aggregates of the elements.

- EXTERNAL CAUSALITY THINKING
  This approach involves bringing in contextual elements and allowing for tree-like causalities. For example, astrologers claim the existence of a causal linkage between the orbital cycles of heavenly bodies and the physiological and

Factual ≠ True

"Bible is true, but not factual"





FOR 2007

YINYANGT.P51 DISK:~~ESSAYS1~~ 03/26/86

YIN THINKING	YANG THINKING
Integrative	Reductionistic
Persues similarities	Seeks differences
General	Specific
Context	Content
Address	Content
Subsuming	Focusing
Sensitive to Feelings	Emphasizes principles
Seeks Completion	Seeks perfection
Looks at potentials	Looks at what is
Brain-storming	Decision-making
Meaning	Explanation
Focus on Relations	Focus on Individuals
Tools	Skills

Why differentiate yin/yang thinking? Important to know when and where to use each type. Under what conditions do we use each?

As a first approximation, use yang thinking whenever we must make a decision; use yin thinking whenever we need to expand our world view or approach to problem solving.

How to describe thinking?

similar to	different from
constructing	day-dreaming

Quadric diagraming

explanation

"dogmatic"
completion

perfection
"we've got all the answers"

meaning

tools

individual group

skills

Note that in this diagram, there is no dependency between the two axes. No way to relate the diagonals.....

Implications of yin thinking: builds bridges, connections, families

Implications of yang thinking: developes 'great men', isolates territories.

YINYANGT.P51 DISK:ESSAYS1 03/26/86

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Why differentiate yin/yang thinking? Important to know when and where to use each type. Under what conditions do we use each?

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[BEYOND YIN/YANG THERE IS ITERATION OF YIN/YANG AND THERE IS "ORTHOGONAL JUXTAPOSITION" (WHICH IS NEITHER STRICTLY YIN OR YANG). ORTHOGONAL JUXTAPOSING IS THE CREATION OF QUADRIC DIAGRAMS. THE ATTRIBUTES THAT ARE CLOSE IN MEANING GIVE LITTLE OF INTEREST IN A QUADRIC JUXTAPOSITION, WHEREAS THE ATTRIBUTES THAT ARE REALLY DIFFERENT LEAD TO INSIGHTFUL DIAGONALS.

How to describe thinking?

similar to different from

constructing day-dreaming

Quadric diagraming

explanation

"dogmatic"

perfection completion

"we've got all the answers"

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tools

individual group

1991 #16

ALTHNK01.P51 DISK: EPIONTOLOGY January 26, 1991

STYLES OF THINKING

ALTERNATE WAYS TO THINK

- LOGICAL THINKING Serial, Linear thinking

  The classical mode of western thought first systemized by Aristotle. It forms the basis of mathematical, scientific, and systems thinking, and to some extent is an ingredient of theological and legalistic thought. The concept of <u>proof</u> is unique to this mode of thinking. It begins with postulates, derives consequences by rigorous deductive canons, and posits it conclusions as being proved. Its limitations have been demonstrated by Russell, Whitehead and Gödel.

- ANALYTIC THINKING

  The top-down application of logical thinking.

- SYNTHETIC THINKING

  A bottom-up constructionist approach using such methods as juxtaposition, association, and metatphor. Multi-leveled, but not necessarily Machian.

- PATTERN THINKING (see back of page) (Paradigmatic Thinking) Paradigm = Pattern in Greek

  multi-dimensional

  Paradigm Metaphor

  Consider the overall pattern and even though certain links may be missing, continue to construct a self-reinforcing whole. This type of thinking is exemplified by Sherlock Holmes' approach to solving murder mysteries. It includes such questions as motivations, who stands to gain, to lose. This approach is oftimes used in courts for evidence, but is never to be regarded as constituting <u>proof.</u> Circumstantial Evidence No smoking gun

- JUXTAPOSITION THINKING

  basic to all thinking

  Put ideas in juxtaposition and let them speak to one another - semiclinical

  Placing items in juxtaposition and reading the space between them. It is useful for investigating possible commonalities, establishing alternate linkages and for synthetic thinking in general. It is an anecdote to associative thinking in that it may generate counter-intuitive or anti-associations. For example, if we generate a set of cards each containing an item and place cards in juxtaposition in various combinations, sometimes hitherto unsuspected commonalities are revealed and in the "space between the cards" we may discover something we did not previously suspect.

- REDUCTIONIST THINKING

  This approach assumes a bottom-up causality, the properties of the parts determining those of the whole. It is deficient in accounting for the emergence of new properties which arise in aggregates of the elements.

- EXTERNAL CAUSALITY THINKING

  This approach involves bringing in contextual elements and allowing for tree-like causalities. For example, astrologers claim the existence of a causal linkage between the orbital cycles of heavenly bodies and the physiological and

Scan - Select - Zoom

1. Identify Parameters — How? — Start with Laundry Lists
   1. ~~Both~~ dyads
   2. Non-known varieties
   3. Create opposites, dyads, quadrics
2. Release them, let them range broadly generating alternatives
3. Juxtaposition with "real world" experience.

Thinking ⇄ Communication

using for the essence

necessity of linearization
Examples + Anecdotes
repetition

← Review → Adage

More on

- Pattern thinking

  Pattern thinking is multi-dimensional as contrasted to linear or logical thinking.
  Pattern thinking can be rational but not necessarily logical
  It deals with patterns, images
  Whereas linear thinking may be blocked by a missing piece of evidence, Pattern thinking can make an end run (circumstantial evidence)
  Pattern thinking is not proof
  e.g. the efficacy of certain drugs in certain cases
  it runs into the hidden variable dilemma when one seeks to linearize it.
  Linear thinking is logical, masculine, direct
  Pattern thinking is intuitive, feminine, indirect

RECURSIVE THINKING

Cogito ergo sum

also Stochastic Discharge Thunder-Lightning

psychological rhythms of living organisms. Science recognizes some of the correlations, but rejects causal linkages. The ExCaus approach postulates a third external source of cycles which supplies the zeitgeber for both planets and biorhythms.

- STOCHASTIC THINKING
  Fuzzy sets — Devil's Article + Clipping from Peggy
- SERIAL THINKING
  Linear, one level, and inferring a deterministic infrastructure. The basic format of most pedagogy and stories. The essence of our worldviews re evolution, history and progress.

Causality

- PARALLEL THINKING
  Both horizontal (independent modules to be used in juxtaposition and assembled into any meaningful congeries or hierarchies) and vertical (parables and multi-level stories).
- ASSOCIATIVE THINKING — limited to sequence of personal experience
- METAPHORICAL THINKING
- EXPANSIVE-CONTRACTIVE THINKING
- PEDAGOGICAL THINKING
- HISTORICAL THINKING
- HEURISTIC THINKING — Occam
- CONTEXTUAL THINKING
- TOP DOWN THINKING
- BOTTOM UP THINKING
- INDUCTIVE THINKING
  An asymmetrical method which is restrictive in validation but conclusive in falsification. (Popper)
- SERENDIPITY
- FAITH and BELIEF
- SYNCHRONICITY
- PARADOX

DIAGNOSTIC THINKING
e.g. BRUNSWICK MAINE

MYTHIC THINKING
e.g. EARW

MORPHOLOGICAL THINKING

Unthinkable Thinking
e.g. Casey + the Iranian Hostages
"No one would do that..."

Mathematical Thinking: → Generalization
inclusiveness, comprehensiveness
The insult, "... is a special case of..."

I THINK ↑ — The flash light
IT THINKS IN ME ↓

INTUITION

Adventitious Ideas: Those ideas which appear to come from without, from sources outside the mind. The opposite of innate ideas.
V.B.
See Runes dictionary p5

Virgin Birth

Consciousness is not solely a matter of self-reference?

MUTUALITY THINKING

Items may be organized either serially:
step-wise, logically, pedagogically, historically
or in parallel:
i.e. juxtapositions
to reveal commonalities =
+ differences ≠
but primarily to display contradictions
and paradoxes
The process of juxtaposition requires
that we not interact with the items,
but allow the items to interact with each other.

Juxtaposition as || thinking
Dia-peri " " "

SUMMARY OF COGNITIVE CONCEPTS

1. Framing — PACKAGING ~~W~~ FRAMING
2. Set-subset interchanges
   WHENSET.WPD
3. Scalar thinking
   Law of the excluded middle
4. Vector thinking
   Vector victory =?
   Successive approximations — gradualism [MLK]
5. Control of contexts
   CHALKCIR.WPD
6. Applications
   A. Conflict Resolution
      Two Party
         War
         Negotiation
      Three Party
         Litigation
         Arbitration
         Mediation — synthesis
   B. Spin

TOOLS

VECTOR THINKING:

$Re^{i\theta}$

Success is not about position R_i or $\frac{dR}{dt}$, it involves θ

[Jefferson quote] which direction are you going facing

There are many with large R_i and $\frac{dR}{dt}_i$ with disasterous θ_i's

There are some with a good θ_i, but who limit R [people → sheep, simplification]

R_i can be thwarted

θ_i can be diverted

ITERREP
1990 #14

VOCAB3.WP5 DISK:MATHPROGRAM 01/10/90, 11/03/90

REPETITION

The inputs to the system and the outputs of the system remain the same.
Cycles are identical.
Symbol: A closed loop.
Example: Planetary motion.
Parameters: Cycle number.

ITERATION

The output of the system becomes the next input to the system.
While the system operation remains the same each output is different.
Symbol: A spiral, a helix, or a set of concentric loops.
Example: Growth, evolution, chaos
Parameters: Cycle number, input, output

RECURSION

Part of the output of the system becomes the next input to the system.
The 'reinvested' changes scale, the residue collects or is consumed.
Symbol:
Example: Om Mani Padme Hum, where Hum = Om Mani Padme Hum ,
Parameters: Cycle number, input, output, part, whole

RECURSIVE
$F_{n+1} = F_n + F_{n-1}$
Formula for local behavior
vs
Exhibit for total behavior

NESTING

A discreet form of iteration

REGRESSION

A discreet form of iteration or recursion

EQUALITY

$A \geq B$ and $A \leq B$ infers $A = B$

MUTUAL CONTAINMENT

$A \geq B$ and $A \leq B$ does not infer $A = B$
In fact we may have $A > B$ and $B > A$ both valid. (loop)

There are evidently many species of iteration and recursion. Where does transformation fit in? Where does the Great Dialectic fit in?

emergence ?

REPEAT.W52 January 11, 1994

ITERREP, PSI
See Repeat 1990 #14

ON REPETITION

INDUCTION VS. DEDUCTION

The sage Li Kiang once said, "I was not convinced by the logic of the argument, but I was persuaded by the repetition of the argument." Whether Li Kiang was merely confirming the basic tool of the advertizing profession or stating that the persuasive power of induction is superior to that of deduction, is not known. Maybe he meant both, or neither. But it is true that repetition carries more impact for most of us than does logic. Perhaps this is because we came to the truth that the sun rises every morning through repetition of the act, not by logic. (Later through logical arguments the repetitive rising of the sun could be "explained", but even so, the explanation was based on postulates having their origin in repetition.)

Another point, repetition is more inclusive than logic. Logic suffers from its built-in constraint of consistency, while what is repeated need not be consistent with anything else that is repeated. Thus induction allows the acceptance of a larger world than does deduction. And induction's world does not allow itself to be forced into the bottle of consistency: **Eine Theorie, ein Entwurf, ein Gott.** We conclude logically that Logic is not the best epistemological tool for encountering this world.

There is an ancient Persian proverb that states that there are two kinds of truth: Truth established by repetition, and truth independent of repetition. One kind requires perpetual repetition to preserve its status as truth, the other kind is true without any fenestrations. [Which kind is this proverb?] But here we must use logic to keep from falling into a trap. We must discriminate between what or who is doing the repeating. Repetitive sunrises establish a physical truth or law. Repetitive advertisements establish "Pavlovian" truths, truths imbedded in the mind of a beholder, but not necessarily existing elsewhere. That natural truth derives from repetition may lead us to infer that repetition per se will always manifest such truth. But this is inductively not so. Every set of repetitions does not lead to objective truth, some merely transform the observer into Pavlov's dog. Granting the truth of the Persian adage, How are we to know which inductive truths are objective, which subjective. We concur that repetition, or persistence, has the power to transform, and hence that repetition either reveals what is or guides what becomes: present truth or future truth.

This is why advertizing works

How does Popper's falsification bridge induction and deduction?

Are archetypes sustained only through repetition?
Who or What is doing the repeating in the case of archetypes?

Is Understanding more than just familiarity?
yes, it also involves predictability

Familiarity involves recognition
Understanding involves recognition
Recognition involves repetition

The apparent popularity of science has been in its dealing with the repetitive, the visible, it deals with the universally familiar and accessible.
Modern theories however, do not fall in this category.
They deal with the unexperienced, the unverifiable and hence become arbitrary. Modern cosmology is but another theology

Science deals with repetitively established truth. It is based on reproducibility, a species of repetition. In general what is not repetitive is beyond the ken of science. This raises some interesting questions with regard to scientific cosmology. If there exists but one universe and its origin was a one time big bang, lacking repetition, the universal lies outside the ken of science. For science to deal with cosmology, the universe must be either fractal-like, that is repetition of the originating process occurring repeatedly but on different scales, or there must be multiple universes of some sort.

NEWTHINK.WPW 03/11/93

The New Paradigms

The new paradigms of thought and values [Einstein Quote]
from Belonging to the Universe

Fritjof Capra's five new paradigms (from Belonging to the Universe)

- Parts ---> Wholes
  The interdependence of all phenomena and their embeddedness in the cosmos p70 ? Mach ~~W~~, Gödel
- Structure ---> Process ✓
- Objective ---> Epistemic
  The epistemology selects the universe ✓
  Constructivism as the new epistemology p124
  The observer is a necessary part of the observation ✓
  What we observe is not a world that exists objectively and is then represented, but rather a world that is created in the process of knowing {[the cognitive operator]} ✓
- A building ---> A network as metaphor for knowledge ✓
  No up no down, no foundation, no primaries, only network
  {[What about islands and continents?]}
- Truth ---> Approximations ✓

Other changes mentioned by Capra

Rational ---> Intuitive Discursive vs. Intuitive
  Rational is the compartmentalized, the catagorized
Analysis ---> Synthesis
Reductionism ---> Holism
Linear ---> Non-linear

Thinking and values are intertwined. Consequently new paradigms of thought will create new values. p74

- Self assertion ---> Integration
- Competition ---> Cooperation
- Expansion/Growth ---> Conservation/Sustainability
- Quantity ---> Quality
- Domination ---> Participation

Other developments: "The Great Dialectic" p125
Two Systems Schools von Neuman input-output, information processing

Norbert Wiener cybernetics, self-organizing

page two

Other Paradigm Shifts

- Zwicky-McLuhan Multiple Model Approach
  - Listen to more than one composer's music
    - Mystery does not allow an orthodoxy
  - Parallel Computing
    - The end of linear, sequential, mono thinking
    - The end of monotheism (---> pan-entheism)
  - Pluralism
    - Tolerating and valuing differences

open endedness does not allow orthodoxy

monochrome

- Facetism, Complementarity, Aspectism,
  Defacetize vs. generalize and abstract

- Whyte's Patternism
  Pattern, Structure, Process
  Information, Matter/Energy, Will

- Einstein's Absolutes ---> Invariants

- McLuhan's Suspended Judgement

- Thompson's Juxtaposition

The roles of analogue and digital
Platooning

CRITHINK.WP6 April 18, 1995

SOME NOTES ON CRITICAL THINKING

Critical thinking is thinking that follows a set of canonical rules, including the canonical set of no-rules. Rational thinking is a particular subset of critical thinking that employs the rules of some brand of logic, such as Aristotelean logic, or the rules of evidence used in courts of law.

The Hierarchy

CRITICAL THINKING
RATIONAL THINKING SP
LOGICAL OR SYLOGISTIC THINKING

SOME OF THE TOOLS OF CRITICAL THINKING:
JUXTAPOSITION ZOOMING
VIZUALIZATION CONSILIENCE
FALSIFICATION
PATTERN INFERENCE (VS. LINEAR OR LOGICAL THINKING)
QUADRIC DIAGRAMS
RATIOS AND PROPORTIONS
STANDARD REGIONS
INTERGHANGE GROUND AND FIGURE,,,DUALS
WHO BENEFITS? (CF SHERLOCK HOLMES)
IMBEDDING IN LARGER CONTEXT LIN
APOPHASIS DISCRIMINITIVES
DATA DISPLAY

THE TRIVIUM
GRAMMAR
LOGIC
RHETORIC

THE QUADRIVIUM
ARITHMETIC
MUSIC
GEOMETRY
ASTRONOMY

ANALYSIS VS SYNTHESIS
DEDUCTION VS INDUCTION
KNOWLEDGE VS UNDERSTANDING

TRUEFALS.WPG

#52

A TRUE-FALSE TEST September 1, 1995

1. Is the following sentence true or false?

Their are two errors in this sentense.

2. Is the following sentence true or false?

Their are three errors in this sentense.

3. Is the following sentence true or false?

Their are four errors in this sentense.

The first sentence is clearly true. The third sentence is clearly false.

It is the second sentence that is ambiguous. It may be interpreted in two ways. There are two spelling errors in sentence 2. The sentence says that there are three errors therefore the sentence is false. However, saying that there are three errors when there are only two is itself an error, therefore there are three errors and the sentence is true.

If errors are restricted to content, such as spelling, then sentence 2 is false. If meaning is also included, and two levels are considered, the level of content and the level of meaning, then sentence 2 becomes true.

We have here an example of a statement that is both true and false, depending on how it is viewed. Such propositions arise when levels or classes are involved. From this it follows that Aristotle's logic which is based on the Law of the Excluded Middle, viz, every proposition is either true or false, is limited to one level discussions. Aristotle's logic is a "horizontal logic" and when the vertical is present a different logic is required.

In a logic which can include the vertical, i.e. multiple levels, an operator is required that corresponds to the horizontal operator, NOT. Maybe this is the operator NO, or possibly the Zen MU, if taken as an operator.

Not like th "who shaves th barber"? paradox

ON GENERALIZATION EMBEDDING

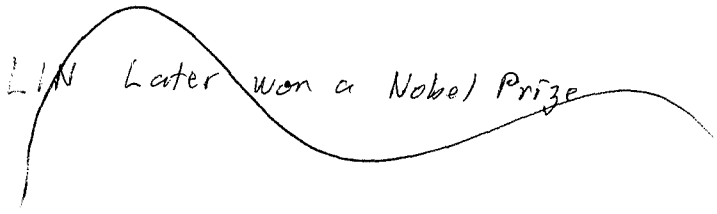
When I was a graduate student at CalTech back in the 40's there was an important second order differential equation that no one had been able to solve over the past few years. A Chinese graduate student named Lin became interested in the equation. About two weeks later he astounded the faculty and everyone else by presenting the solution. I do not recall the details but the important aspect of the story is how he solved the equation. Lin took on a more difficult problem. He imbedded the second order equation in a generalized equation of the third order. He found a class of solutions for the third order equation then was able to select which member of the class would work satisfactorily for the original second order equation. Evidently what was not visible in the direct approaches to a solution of the second order equation became visible when the problem was viewed in a more general manner.

E.T. Bell, professor of mathematics and then head of the department, remarked that only someone brought up in a non-western background could have come up with that approach. Complicating the problem and thus perceiving more possibilities. Climbing past the specific obstacle then looking back down from above. Ordinarily we have only the viewpoints from below. Viewing from above, a totally different vantage point, discloses paths invisible from below.

Mathematicians have always tried to make their results as general as possible. Now, thanks to Lin, we have an additional practical application for generalizations.

or abstractions?

Footnote
Lin went on to later win a Nobel Prize


L.I.N Later won a Nobel Prize

QUADRICS

Oct 1997 #26

Oct 1995 #52

THE TEACHINGS OF SRI SIVARAMKRISHNA

1. Coming to your country I find that you base deductions on a very restrictive type of thinking. I believe I have heard that this was put in place by Aristotle. It is a type of logic that excludes the conjunctive, allowing only the disjunctive. You hold for example that statements are either true or false. What is called, I believe, the law of the exclude middle. It does not allow the conjunctive, that a statement may be both true and false, nor does it allow that a statement may be neither true nor false. But the Greek Philosopher Plato said that the opposite or negative of every important truth is also true. There is thus admittedly a class of statements that are not subject to Aristotle's law of the excluded middle.

We may say, for example, that every time is either day or night. but there is that time which is both day and night, namely the 24 hour Day. And there is that which is neither day nor night, namely dawn and twilight. In the courts, a person on trial is either innocent or guilty. However, he might be both or neither, depending on the context taken into consideration and on the degree of specificity of the law. The quantum physics says that entities are both particles and waves, which aspect is manifested depends on the way the experiment or observation was made. A purely disjunctive logic fails to reach into the contexts in which categories are imbedded and into the gaps that lie between categories. A purely disjunctive logic consequently imprisons conceptions of the world into a narrow slice of its fullness.

In what follows some of what I say will be right, some wrong, some both right and wrong and some will be neither right nor wrong. An open dialogue with the universe must allow us all four categories of statement.

2. The whole contains every part and every part contains the whole. The entire universe lies both within us and outside us.

3. Mind is both local and global. Mind is both personal and public.

The West has learned to row, but not to steer
The East has learned to steer, but not to row

-LK

3 complete

SOME TEACHINGS OF SRI SIVARAMKRISHNA

1) For some reasons, probably historical, the West and the East employ two different logics. This fact may play a considerable role in establishing the differences implicit in their respective world views: A one level materialism in the West and a multilevel ontology in the East. The West has adopted a purely **disjunctive** logic, traceable to Aristotle. Its base is the 'law of the excluded middle", which says that every proposition is either true **or** false: One **or** the other. This type of logic excludes the **conjunctive** which is included in the logic of the East: One **and** the other. Nonetheless, Plato, coming before Aristotle, held that "the opposite of every great truth is also true". If a truth is "great", both it and its negation are true, a violation of the law of the excluded middle. Thus, even in the Western tradition, there may be admitted a class of propositions beyond the class of true or false, statements that may be both true and false and statements that may be neither true nor false.

For example, the statement: time is either day or night. But there is time which is both day and night, namely a twenty four hour period. And there is time that is neither day nor night, e.g., dawn and twilight. In the courts, a person on trial is either innocent or guilty. However, he might be both or neither, depending on the **context** taken into consideration and on the degree of **specificity** of the law. Quantum physics demands going beyond the law of the excluded middle. The fact that entities are both particles and waves requires a non-Aristotelian logic to think about them.

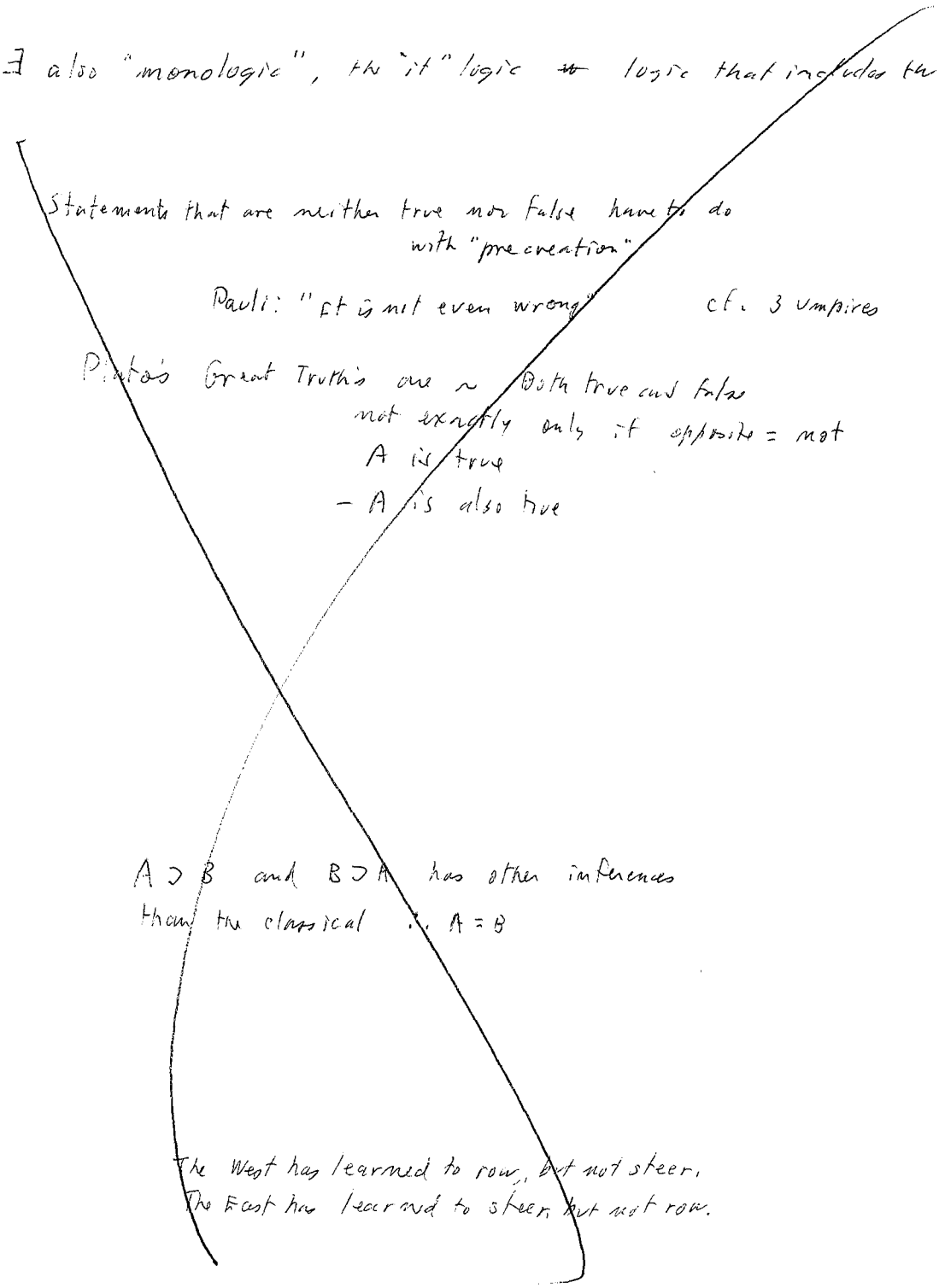
see 1995 #52

A purely disjunctive logic fails to reach into the contexts in which categories are imbedded and fails to consider the gaps that may exist between categories. These limitations were recognized by Russell and Whitehead who attempted to correct two valued logics in their Principia Mathematica. A consequence of a purely disjunctive logic is a conception of the world that distorts its real structure and denies its full richness. An open ended dialogue with the universe must permit the validity of propositions that go beyond the law of excluded middle.

2) The whole contains every part and every part contains the whole. This ancient truth has been discovered in the West by technology through the invention of the hologram. The entire universe exists within each of us as well as each of us existing within the universe. As five hundred years ago it was difficult for people in the Spanish Court to understand that the East could be reached by sailing west, it is difficult for people today to understand that the infinite may be reached through the infinitesimal, by going within, by centering down into the immediate local and present.

UPANISHADS

∃ also "monologic", the "it" logic ~~is~~ logic that includes the logician



Statements that are neither true nor false have to do with "precreation"

Pauli: "It is not even wrong" cf. 3 umpires

Plato's Great Truths are ~ Both true and false
not exactly only if opposite = not
A is true
$-A$ is also true

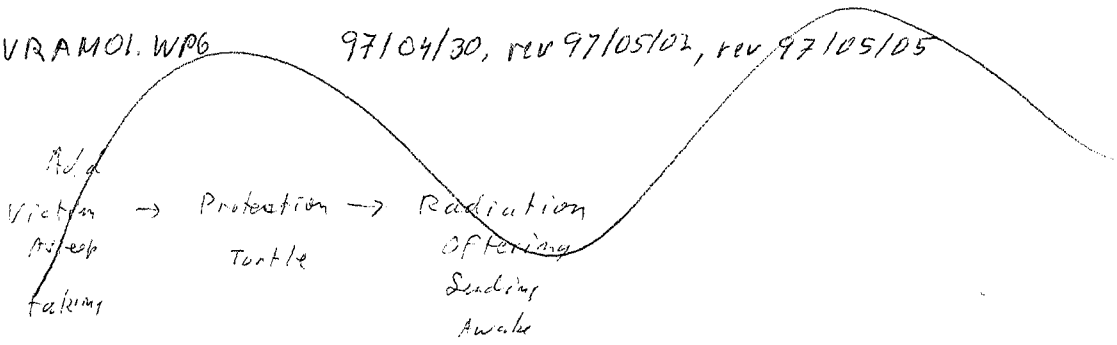
$A \supset B$ and $B \supset A$ has other inferences than the classical $\therefore A = B$

The West has learned to row, but not steer.
The East has learned to steer, but not row.

3) For most people today it is also paradoxical that access to fullness, to completeness, is acquired along the path to emptiness. It must be learned that one cannot make progress on the trail to true treasure while loaded with collectibles. It must also be learned that one cannot successfully follow two paths, a career path and a spiritual path. A choice and a commitment must be made.

4. The nature of mind is also holographic. We each possess a mind and a MIND possesses us. Minds are both personal and public. There are many public minds as well as millions of personal minds. Minds can merge, fracture, grow and diminish. One must become aware of which mind one is tuned to. But most important, no mind is local in space or time. This is what permits minds to have access to one another and to MIND.

SIVRAM01.WP6 97/04/30, rev 97/05/02, rev 97/05/05



CHANNEL1.WP6 August 16, 1997

ON CHANNELING

While in English it is common to say 'I think', in ~~several~~ some other languages the direction is reversed, coming out when translated as 'it thinks in me'. And even in English we sometimes say 'it occurred to me'. All of which suggests that there is some confusion on the location of the source of thought. We honestly may ask, 'Does thought originate in us or are we merely channels bringing the thought from some unidentified source into our heads and out of our mouths?' Perhaps both. Most of our thoughts 'we think', that is we originate them, we are the source. But there seems to be another species of thought that really does come to us from elsewhere.

This second species of thought usually has to do with creativity. It may come in words or in images, or in what we call inspiration, breathing in, so to speak. Remember, the Greeks felt that the source of creativity, in art, poetry, music, dance,... resided in communications from the muses, who were external to our heads. And even the great genius Isaac Newton, in an uncharacteristic lapse into humility, seemed to credit externals when he said: "If I have seen able to see farther than others, it is because I stood on the shoulders of giants."

The New Age has brought into our midst a group of 'professionals' who not only acknowledge an external source in their thinking, but boast of it and charge for it. These so called 'channelers' even assign @ names to their sources. Usually some ancient Egyptian or Medieval sage. When we compare the depth of the channeled message with the ordinary capabilities of the channeler, we begin to suspect that there may really be something channelled from an external source. I have to admit that many times when I have some sort of insight, it must come from some external source. With my background, I couldn't have possibly come upon the idea myself.

All of this leads to the category of thought process I call 'recognition'. Such recognized thoughts do not arise from sensory experience, nor are they contained in memory. To attribute them to Egyptian sages or past lives seems too simplistic. I feel they come to us when we have established access to MIND. And what is MIND? It is not the everyday pool of mental noise we call mind. It exists on a different level and is reached only as a consequence of some disciplined practice. It is reached by persistant attention or focus on some question or activity. It is the result of replacing the filters @f built by our egos with an undedicated openness.

[There exists an openness<>ego dialectic]

Recognition
Thoughts ~~without~~ Thinker

PACKAGE1.WP6 August 28, 1997

methodology

PACKAGING

See 1995 #92
1994 #43
#45
#61

Religion uses several approaches to a single subject.
Science uses a single approach to several subjects.
—Li Kiang

Both religion and science do 'packaging'. Religion packages morality, psychology, and cosmology into a bundle tied together by the teachings (scriptures, gospels, dharma, etc.) of a particular teacher (Moses, Jesus, Buddha, etc). Science packages astronomy, physics, chemistry, biology, ... into a bundle tied together with a single epistemology called the 'scientific method'. In both cases consumers are forced to buy packages and are locked into sets of associations that in many instances violate experience, create areas of dispute, avoidance, and ~~unapproachability.~~ incomprehensibility

e.g. psychology needs a different 'scientific method'

The tradition of packaging is so inbred that we no longer realize that the parts could be put together in alternative ways. Much of knowledge has frozen into a 'solid state' impervious to any restructuring. Our 'fundalmentalist' way of thinking refuses to be selective. It insists on eating the whole thing, taking it all together or else. While everything may be related to everything, and the world at some level may truly be monistic, it is not necessarily organized the way we think it is. While the pieces, the parts, may be valid, our picture of the whole may not be. This we suspect when so many pieces have to be left out in order for the present view of the whole to fit together.

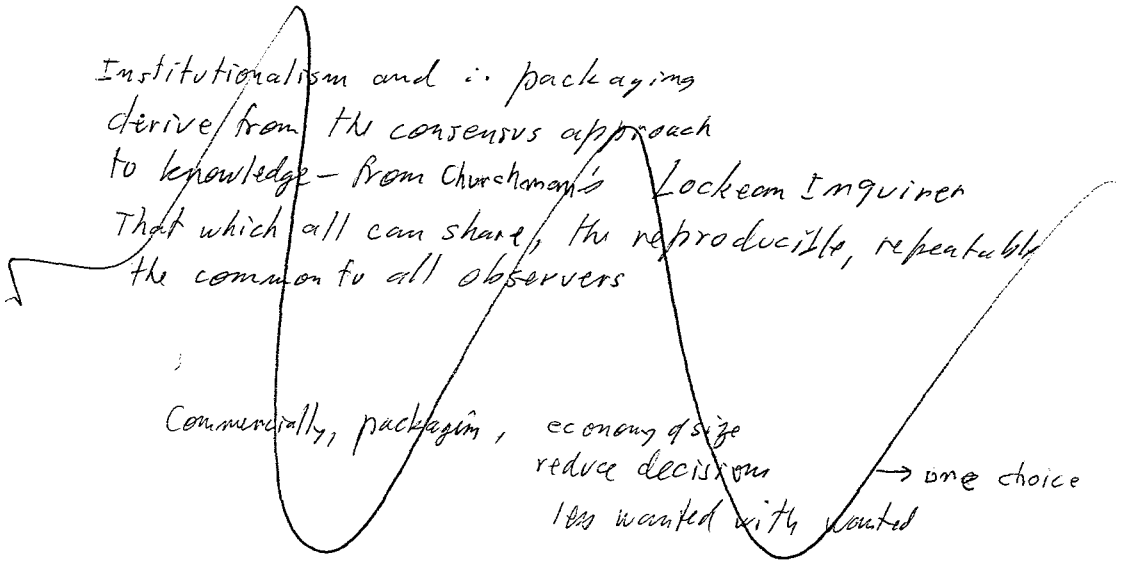
no middle ground

I recall an interesting example of a viable scientific alternative. Dr. Clemence, director of the U.S.Naval Observatory, in discussing the compilation of the American Ephemerides noted that the computer calculations ~~of the~~ nearly all the times were based on a Ptolemaic view of the solar system rather than a Copernican view. From a computer's point of view epicycles were simpler than elipses. In seeking the simplest structure, [Occam's Razor, an intrinsic ingredient of the scientific method], we must realize that what is simplest is an anthropocentric subjective view and may be quite different from the 'ortho- structure' underlying the system. We, of course, want to get to the 'ortho-structure', but how can we **recognize** it except by Occam's Razor?

redo

ortho ≠ simplest

Assuming there are some who wish to buy only portions and not have to purchase the whole package, how is this to be done? How can we cut the cords tying together the package without losing or damaging the contents? The answer lies in that packaging is done by institutions, religious institutions, political institutions scientific institutions, groups whose interest is primarily power and control. To escape packaging abandon institutionalism! As one stand-up comedian put it. "Everywhere people are abandoning the church and going back to God".


Institutionalism and ∴ packaging
derive from the consensus approach
to knowledge – from Churchman's Lockean Inquirer
That which all can share, the reproducible, repeatable
the common to all observers
Commercially, packaging, economy of size
reduce decisions
→ one choice
less wanted with wanted

WMDYADS1.WP6 June 13, 1997

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

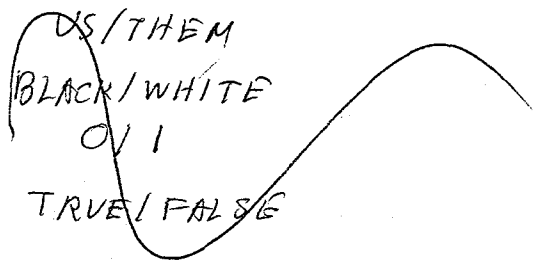
It is not surprising that the consummation of centuries of white man's creativity takes the form of the digital computer. The white man's way of viewing himself and the world is reflected in his creations, and the computer like its creator, is formatted in the black and white of dyads or binaries. In the white man's arithmetic everything is ultimately reducible to zeros and ones. In the white man's logic everything is forced into true or false. In the white man's ethics everything is considered either right or wrong. In the white man's justice the findings must be either innocent or guilty. With the white man's dwellings one is either inside or outside. In the white man's cities space is either private or public. etc, etc. But is the world really binary? Has not something important been allowed to fall between the crack that separates zero from one by ignoring the values between right and wrong, the levels between true and false, and the transitory spaces between inside and outside?

In our houses we pass directly from outside to inside through one door. Sometimes there may be a bit of a transition provided by an overhanging eve or in increasingly rare instances there may be a porch, anachronisms from a pre-digital age. Lin Yutang in his book, The 'Importance of Living', describes a particular arrangement for the many transitional steps that should exist between outside and inside:

> First, there is a gate and the gate must have a roof. Inside the gate there is a footpath and the footpath must be winding. At the turning of the footpath there is a screen and the screen must be woven of bamboo. Behind the screen there is a pine tree and the pine must be gnarled and old. At the foot of the pine there are rocks and the rocks must be quaint. Beyond the rocks there is a spring and the spring must gurgle. Above the spring there is a pavilion and the pavilion must overlook a pond. Across the pond is a bridge and the bridge must be tantalizing to cross. At the end of the bridge is a grove of trees and the trees must be tall. And in the grove is a house and the house must be secluded.

Our digital culture is not only draining the color and variety from our lives but is also pushing us into a bland homogenized landscape whose uniform plainness serves to dissolve existence itself. Imagination, fantasy, poetry, may all lack practicality and efficiency, but they keep the world from collapsing.
Pythagoras knew that whatever is reduced to one becomes extinct. In stripping the world to the binary, but a single brief step remains between ourselves and our demise.

Examples of the binary



REPACK1.WP6 September 11,1997

RE-PACKAGING

The **cultural** business of the 21st Century will be de-packaging and re-packaging, and the **cognitive** business will be de-entifying and re-entifying. By this is meant that, assuming the elements or modules of experience have been adequately validated, the traditional groupings or manner of linking these modules, is very much open to question and revision. An example from astronomy: The ancients noted certain patterns or arrangements of the stars in the sky. They grouped stars which were in proximity on the sky together into packages called constellations and gave them labels such as, Aries, Orion, the Pleiades, etc. These groupings were endowed with certain astrological attributes and felt to possess physical and metaphysical reality. Over time it was found that apparent proximity was a poor clue to the way stars were actually grouped. Many groupings on the sky were seen to be illusory when the distances to the various stars had been determined. Some groupings, however, such as the Pleiades were real, being clusters of stars at the same distance, with the same motions, and of the same age. Other real clusters were found that consisted of stars that were not in close proximity in the sky, but had other physical parameters in common. It was found that to check our perceptions regarding the reality of an entity, more than one parameter had to indicate grouping. Aside from astronomy, there are many examples of our assuming a package of modules or events is a real entity when in fact it is only a 'constellation'. It is important that we escape these illusions, but of equal, if not greater importance, is detecting entities that exist but have so far been overlooked because of the way we customarily do our packaging. cf Arp's qvestions re redshifts

In the 20th Century we have been treated to a deluge of ad hoc packagings. In war time the enemy is packaged with every real and projected evil. The advertising industry is continually packaging various products with success and happiness. Smoking, for example, has been packaged with sophistication and glamour, whereas its real package is with heart and lung disease. Certain ethnic groups have been packaged with certain proclivities, the Scotts with thriftiness, the Germans with methodicalness. Some societies suffer with packages that other societies do not have. The Chinese, for example, are struggling with what should be packaged with socialism. Dong Fureng, top economic advisor to the Communist Party, in order to facilitate privatization and modification to a market economy, insists "Socialism means seeking social equality, not that the state has to keep a majority stake in every industry". But perhaps the most difficult re-packaging facing those who would re-entify lies in the structure of language itself.

CODEBK02.WP6 APRIL 20, 1998

See 1998#6

MORE ON CODE BOOKS

In English, and I suppose in almost all human languages, ofttimes a single word stands for many things. This obstructs our making important discriminations and leads to misunderstandings in communicating. For example, take these three words:

Consciousness LOVE
Suffering DEPRESSION
Thought

What does each mean? Ask and you will get many answers. Each is a bundle of multiple meanings that dictionary definitions fail to display. But more seriously, the packaging of diverse meanings in a single word creates associations that shackle our thoughts to particular patterns. Language enables and entraps a perception of reality.

Each language packages concepts and meanings differently. While the packages are pretty much the same for most common things, such as water, window, wine, a fact that makes translation possible, when it comes to concepts less tied to sensory inputs, the packaging varies, making translation error prone. Thus a dictionary, which is a "level I code book" works only for shared packages. Eastern metaphysical writings cannot be translated into a western language using a level I code book. Only if the experiences are shared can the words for a proper "joint packaging" be found. Or a level II code book is required. Likewise, the language of modern physics cannot be translated into vernaculars since it is based on experiences with particle phenomena that most of us have never had. A level II code book is required.

Question: Is all thought carried on with words? Perhaps it would be better to ask, Is all thought carried on with symbols? This generalization because we are also able to think in terms of mathematical symbols, in some cases without any supplementary words. We also have "feelings", which seem to exist without words, many times it being impossible to articulate them. Feelings vs. thoughts? Maybe it would be proper to say that the class of feelings contains the class of thoughts as a subclass; the thought subclass consisting of those feelings having finer discriminations and consequently being representable by specific symbols. But we have seen that even the thought class at time requires a level II code book, what level code book is required to communicate feeling? And here feeling includes spiritual and mystical experience, frequently spoken of as ineffable, meaning without a code book.

Sometimes we are not even aware that there is communication taking place, that there is a message. We might say it takes a "level 0 code book" just to know that there is a message, regardless of whether a meaning can be extracted or not.

OK so we are aware there is a message. What is it saying? If the sender has experiences, feelings, thoughts, packaged the way we package them, then evolving a "level I code book" or dictionary should be possible. Certain messages can then be exchanged. But there may be parts of the message we either do not understand or misinterpret. Either we have not had the experiences or have packaged them differently. What do we do? Usually downgrade the message to make it fit our level-I experiences and understanding.

This is a very real problem, not just speculation on how to communicate with aliens from star system 61 Cygni. It involves the messages given to us by history's great teachers, by bodhisattvas, saints, and mystics. We have taken their messages and translated them with our level-I code books, distorting and omitting in order to make them fit our with our experience and understanding. However, these messages come with their own code book, the only code book that will reveal the true meaning of the message. **The code book is part of the message, it is contained in the message.** Now that is a challenge for us!

diachronic w synchronic here

also for Capitalism and Epistemology

#22

PACKAGE1.WP6 APRIL 21, 1998

ON PACKAGING and labeling

Bill Gates explains Microsoft's bundling of its various softwares with its Window's 95 operating system as follows:

> "When Ford sells a car a dealer isn't allowed to take out the engine and put a different one in. The basic right to define a product and test it and allow it to get to the consumer unadulterated is clearly the law of the country. There is no law of castrated products. Our license is for the whole product."

A more accurate way to describe Microsoft's marketing practice would be:

> When Ford sells a car, you cannot buy it without also buying a two wheel boat trailer, an eight foot power boat, and a five year membership in the Ford's Auto Support club. Or when I go to the supermarket to get a quart of milk, it is only available packaged with Crunchy's breakfast cereal and Otto's cream of onion soup.

Monopoly takes many forms and gives the monopolist many advantages. One of the important advantages is packaging. If there were competitive operating systems, then Bill Gates could not do his package deal. But there are more subtle questions involved. Should Ford sell its car without an engine, without wheels, and the buyer can select these as options. It comes down to the question of what is the proper package for a car or an operating system or anything else. This is not so much a question for the courts and lawyers as for system engineers and consumers. It should be possible to come up with some common sense rules for what constitutes proper packaging.

In nature we observe many "packages", ranging from quarks, nuclei, atoms, molecules, cells, organisms, ... planets, star systems, galaxies, clusters ...and on. These packages appear to be the result of different forces and their interactions. Strong forces creating the nucleus package, electric forces creating atomic and molecular packages, gravity creating various astronomical packages. Derivative from these forces, packages are the result of "sufficient coherent functioning". Both living organisms and social structures are examples. The rule that we can infer from these organic and societal examples is: **A proper package should consist of the minimum parts necessary to perform a prescribed set of functions.** Who prescribes the set of functions? The consumer. Who designs to minimize the parts? The engineer. Keep the damn money monopolists out of the act, even if we have to use courts and lawyers to do it.

When you have an issue, problem, or challenge, you cannot solve it at the same level of consciousness by which you created it.

—Albert Einstein

The same kind of education that led us into the cul-de-sac will not get us out

—Alfred North Whitehead

The environmental backlash we confront today cannot be eliminated just by applying more of the same science and technology that put us in our present predicament.

—Stewart L. Udall

If the only tool you have is a hammer, you tend to see every problem as a nail.

—Abraham Maslow

Philosophy is about the attempts to solve with words the problems that have been created by words.

—Li Kiang

Government is about the attempts to solve with legislation the problems that have been created by legislation.

—Li Kiang

Science is about the attempts to solve with theories the problems that have been created by theories.

—Li Kiang

Religion is about the attempts to solve with authority the problems that have been created by authority.

—Li Kiang

#54

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.)

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.

#69

EXMID.WPD

NOVEMBER 11, 2000
PART I 1999 # 54 NOVEMBER 18, 1999

EXCLUDING THE EXCLUDED MIDDLE[1] PART II

As the year 2000 presidential election in the United States moved toward a fulcrum, a near balance in number of votes between the two contenders, we began to experience the disappearance of the excluded middle. At a fulcrum the option space changes. No longer are the options restricted to those allowed by Aristotle's law of the excluded middle, either [A] or [B], the options suddenly meaningfully include the "illogical" options [both A and B] and [neither A nor B]. The pundits and deans of law schools are calling the vote situation "uncharted territory", and are searching for precedents to guide decisions. It is true that being on a fulcrum is uncharted territory for western logic. But the fulcrum, the place where the interface between contraries is located, is the domain of emergence. At the fulcrum it is possible to transcend Aristotelean polarization. Going beyond [A] and [B] it becomes possible either to synthesize a position from selected components of both A and B, (this means more than negotiation or compromise), or allow the injection of an innovation that completely rejects both A and B. Either of these options lead to emergence. At any fulcrum the choices change from {[A] or [B]} to {[E] or [P]}, where [E] stands for emergence and [P] for continued polarization. Or, put in another way, the choice is to reject or to retain the law of the excluded middle.

From dynastic conflict to business competition human history is centered on an [A] or [B] dyad. Both Zarathustra's theology, the basis of western religions, and Aristotle's logic, the basis of western science, establish a dyadic world view. (Perhaps we should ask, Is a multiplicity of choices beyond two an overload on human information processing capabilities). However, whenever a pair of dyads is put into juxtaposition, (called elsewhere a "cross-dialectic"), the law of the excluded middle is circumvented, and some form of emergence results. (One example is the simultaneous occurrence of the Ptolmaic-Copernican dyad and the Luther-Vatican dyad, resulting in the viability of the reformation, another is the demise of the USSR, destroyed by an economic vs, cultural cross- dialectic). Alternatively, sometimes the positioning of [A] vs. [B] diverts attention from the fact that A contains B or that B contains A. In either of these instances the law of the excluded middle has already disappeared, and some form of emergence is under way. And what emerges in these cases is monopoly, where there is an image of [A] vs. [B] obscuring the reality of A is B. But on a fulcrum this smoke can be seen through.

Conclusion: Business as usual is secure so long as the law of the excluded middle is firmly in place. However, when circumstance leads to a fulcrum, there is a crisis for the [A] vs.[B] dyad. What ensues after encountering a fulcrum is either a revised polarization, between two re-aligned contenders, or an emergence which could be an unpredictable innovation.

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[1]The law of the excluded middle is that of Aristotle's logic, the logic of the western mind. Succinctly, it states that a proposition is either true or false, a person is either guilty or not guilty, an object is either here or there [not here], an event either happened or didn't happen, an entity either exists or does not exist. There is no middle ground. No other alternatives are possible.

#32

COGSTRAT.WPD MAY 5, 2000

NEW COGNITIVE STRATEGIES

We Shall Require a Substantially New Manner
Of Thinking If Mankind Is to Survive.
– Einstein

In 1967 a conference was held to explore new ways of thinking that go beyond such traditional approaches as axiomatics, deductive and inductive logic. This conference was summarized in a book "New Methods of Thought and Procedure" [F. Zwicky, A. G. Wilson, ed; Springer-Verlag NY]. In the Prologue, Zwicky notes that there were several previous attempts to find better ways of utilizing rational thought such as: Aristotle's Organon, Francis Bacon's Novum Organum, Descartes' Discours de la Methode. This conference was held to determine if the scientific and technological experience of the last three centuries had suggested any significantly new methodologies that could increase human cognitive powers.[1] The candidate methodologies contributed to the conference included: Operations Research, Systems Engineering, Dynamic Programing, Information Theory, Game Theory, and Morphological Research. [Why General Systems Theory was omitted, I believe, was either that no one was ~~available to or~~ able to summarize it.] Subsequently the computer has devoured parts of each of these methodologies and adapted them to its routines. But that does not obviate the need for humans to explore methodologies independently of whether they are useful to computers.

Of the methodologies of systematic thought discussed at the 1967 conference I feel that Zwicky's Morphological Research was the most innovative and profound. In one sense the other methodologies streamlined existing procedures, while the morphological method challenged them. At the heart of the morphological method was the concept of *pluralism of solutions*. The task was not to find a solution, it was to generate as many alternate solutions as possible, and to postpone evaluation until the generation phase had been completed. Zwicky outlined the method listing the following procedures:

> The measure of our wealth is in the number and variety of alternatives available to us.
> – Li Kiang

1) Systematic field coverage: Existing objects may be expected to form families whose members exhibit continuous sequences of characteristics. The task is to extrapolate and interpolate the sequences.

2) Flexibility of truth: Any communicable statement which of necessity must be formulated in finite terms cannot be absolute. The task is to suspend belief in any proposition no matter how well established.

3) Limits to the range of validity: Theories can only 'osculate' with reality over a small range of a parameter. The task is to quantify the limits.

NEW COGNITIVE STRATEGIES

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[1] It should be noted that 1967 was at the very end of the pre-computer era, marking about the last date before computer based algorithmic methodolgies became important.

2000 326

4) The value of error and imperfection: Imperfection gives a distorted but useful alternative view. While it might be labeled 'wrong', it nonetheless affords a profitable input. The task is to escape the practice of equating dogma with perfection.

Perception does not give a homomorphic representation of the universe, but a distorted isomorphic representation. -R.W. Gerard

5) The systemization of values: The construction of alternatives requires a set of values to facilitate their selection or rejection. The task is to find criteria for establishing such values, and meta-criteria for establishing the criteria, ...

A theory is the more impressive the greater the simplicity of its premises, the more different are the kinds of things it relates, and the more extended its range of applicability.
- Einstein

This sketch of Zwicky's morphological analysis presents the case that before we can construct a really new methodology we must challenge, disbelieve and set aside what we have so far found. Instead of building on the past we must liberate ourselves from the past. This does not mean that in the end we shall not come again into agreement with what the past has found, but it promises that if we do we shall see it with greater understanding. cf Elrot

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Besides Zwicky and Einstein's proposals for values, Boorstin has proposed: 1) Accuracy, 2) Simplicity, 3) Comprehensiveness, 4) Explanation, 5) Prediction, 6) Economy, 7) Usefulness, 8) Stepping Stone. Or as some others have proposed: Fruitfulness for future models, Precision, Consistency, and Elegance. Now what is needed are criteria for selecting and ordering these and other values.

diachronic - synchronic

#22

TIMEDRV1.WPD FEBRUARY 8, 2001

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...

add Non-locality can be both here and there

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.

#48

ILLEXCTX.WPD MAY 19, 2001

THE ILLUSION OF THE EXCLUDED CONTEXT

I recall on numerous occasions, in many classrooms, in many courses, in many different subjects, the professor beginning his lecture by stepping to the blackboard and drawing a large chalk circle. "Consider the system," he would begin, addressing what was being written inside the circle. When first experiencing this approach, I felt the professor was using the chalk circle to get us to focus our attention on what he was writing in its interior. But somewhat later I began to realize that the chalk circle was a device to magically exclude the effects of everything that existed outside the circle. This made everything so much simpler, allowing us to ignore what we wished regardless of whether or not it could be ignored. The chalk circle approach, inculcated in us by our educational institutions at all levels, has become a basic tool in our mode of thinking about everything from economics to astrophysics. [In science it takes the form of selecting certain parameters to be held fixed, observing the variations of other parameters, and ignoring the rest.] The Illusion of being able to eXclude the effects of Contexts [IXC], together with strict adherence to the Law of the Excluded Middle [LXM] have created wastes, disasters, and absurdities in human society.

> WE SHALL REQUIRE A SUBSTANTIALLY NEW MANNER OF THINKING IF MANKIND IS TO SURVIVE. -Einstein

It is not only the attempt to ignore context, but ignorance of the multi-dimensional nature of context that creates erroneous conclusions. In two dimensions, on the blackboard, we might hold that the chalk circle insulates its interior from the exterior, but in a universe with larger numbers of dimensions than the blackboard, security from context based on a two dimensional insulation is an illusion. Thinking that ignores the context of the past [eg the Balkans], of the future [eg whaling, lumbering, depletion], of the micro [eg genetics], of the macro [eg asteroids], of invisible links [eg cartels, mafias], of secondary forces [eg wind, the Tacoma Narrows Bridge], of ego and arrogance [eg the Titanic], of symmetries [eg tit for tat], and of example [eg violence on TV, White House interns] will not solve problems. Today we see "blackboard two dimensional thinking" in our approaches to energy, health care, education, justice, defense, whatever. Each of these areas are linked to the others, not just through the budget as politicians choose to think, but in their interactions through each of the many contexts.

Many of the disagreements in current society derive from which context should be given priority over the others. These disagreements result in one parameter decisions made by courts, cartels, and congresses, and in response there are counter suits, protests, and terrorists. It happens that there exist algorithms for optimizing multi-parameter systems, no need to select which context, include them all. But employing such algorithms would put lawyers and politicians out of business, and the agendas of special interests would be impeded. .

It ain't gonna happen.

* Castles and catapults

NOT YET A SCRAP

VECTORTH.WPD SEPTEMBER 7, 2001

VECTOR THINKING

Revised

Shaman, Physicist, Lawyer, Theologian

1993#6, 1999#3, 2001#49

The thinking or logic of the theologian was black and white, absolutist, unchanging, dogmatic Parmenidean and Aristotelean; Truth exists and is knowable by revelation

The thinking or logic of the lawyer is a modified holdover from that of the theologian
Black and white, [flawed or perfect], seeking of perfection and permanence, changeable but not evolutionary, substituting self for transcendent authority
reject if flawed for if accepted we would be stuck with a flawed law
Truth is not our department

The thinking or logic of the physicist allows for the probability [quality] of propositions being between certain [absolute is rejected] and doubtful. The validity of a proposition is measured by its repetition and reproducibility. Validity is obtained by stepwise successive approximation. Truth is an asymptotic ideal.

The thinking or logic of the shaman provides for validity and value to exist independently of any activity. No action is required to know or create truth. It exists on its own [Brahman] The repetition of a creed or an experiment is unnecessary. This is the justification of faith.

Vector thinking or logic predicates the prime importance of **direction.** Intention guides thinking and reason even if not acknowledged and rationalized out of the picture. The importance of direction infers movement toward. But direction has significance even if there is no motion. This is because of the ever presence of directed contextual currents that move the position of both the mover and non-mover. [eg ~ the second law of thermodynamics, or the "Red Queen effect"] Face East, Face South, Face West, Face North
Look down, look up

Position, Pure direction, Motion [magnitude plus direction], and Contextual Currents are all involved in thinking and reasoning. The affect on the contextual currents is a most important attribute of all thinking. What direction are we facing?

COGNITANS

THE DEFINITION OF "*IS*"

Unwittingly, President Bill Clinton raised one of the most difficult semantic questions challenging us when he said , "That depends on what ***is*** means". The intransitive verb **to be**, of which **is** is a part, has many assorted meanings. These include **belongs to** as in the previous sentence, also *is* can mean **equals**, **exists**, **contains**, **resembles**, **replaces**, and others.[1] In fact, the meaning of is is not only a semantic question, but in certain applications becomes an ontological question.

Transitive ==> uni-directional, subject acting on object
Intransitive ==> only subject, no object
Mutuality, why no mutuality verbs, bi- or multi-directional verbs? Although mutuality can be expressed, it is by several clauses. Mutuality is not perceived readily, as is illustrated in the structure of our languages.

[1] The verb *is* is also used as part of the passive voice.

CONTROLLING THE CONTEXTS

and selecting

[ZOOMING]

how a color looks depends on the color of the background

When to expand the context, when to narrow it.

The Buddhist narrowing to being in the immediate present, on being only here and now brings peace, and opens a door to some other dimensions. Those moments in nature when we experience great beauty, remove the usual contexts of everyday life .

One of the powers of sex is its focus on the here and now.

Our value systems are a function of the size of the chalk circle we draw. One of the most important radii of the chalk hyper sphere is time. The context of the interval of time to be considered. The size of NOW

Many times the solution of a problem depends on the radius of the chalk circle. The example of $\int \frac{dx}{x}$ and the insoluble second order differential equation that became soluble as a special case of a third order differential equation. Sometime enlarging the circle allows a solution, sometimes narrowing the circle leads to solutions. We could conclude that the solution of every problem involves selecting the right radius.

Our obsessions are at root obsessions about the radius of the circle. Cf Tsun Tzu

It is very important that the "table" consists of many overlapping chalk circles.

Good CEO's can readily change and select chalk circles [the proper contexts]

In general individuals can decrease the radius, but collectives cannot.

Sports are chalk circled

As the radius shrinks, [the field of view], the specificity increases [the resolving power] Hence Stalin's "One or two deaths are tragedies, one or two million deaths is but a statistic. "
As the radius increases , the view becomes statistical

→ COG BOOK

A COGNITIVE MANIFESTO

We shall require a substantially new manner of thinking if mankind is to survive.
–EINSTEIN

To "save" the world it will take still greater freedom of thought than we have been capable of.
–FRITZ ZWICKY

When you have an issue, problem, or challenge, you cannot solve it at the same level of consciousness by which you created it.
–EINSTEIN

The Universe is not to be narrowed down to the limits of the understanding, which has been man's practice up to now. The understanding must be stretched and enlarged to take in the image of the Universe as it is discovered.
–FRANCIS BACON

Perception does not give a homomorphic representation of the universe, but a distorted isomorphic representation.
–RALPH GERARD

It is not logic, but the competitive pressure between tenaciously held and incompatible ideas that makes for progress.
–PAUL FEYERABEND

A theory is the more impressive the greater is the simplicity of its premises, the more different are the kinds of things it relates and the more extended is its range of applicability.
–EINSTEIN

No theory, however good, agrees with all the facts in its domain. Facts that contradict the theory must therefore be ignored, defused by an ad hoc hypothesis, or rhetorically nudged out of the Picture.
–PAUL FEYERABEND

To absorb this century's new perceptions of time and space into our conscious minds, we need the new images that only the creative artist can find, Scientists and philosophers often say, and painters as often deny, that the abstractions of twentieth-century science have passed beyond our powers of visualization.
–ANON

The important thing is not to stop questioning.
–EINSTEIN

WISDOM CONSISTS IN KNOWING WHAT TO OVERLOOK

ABOUT EDUCATION

How to teach rigor while preserving imagination is an unsolved challenge to education.
–RALPH GERARD

Imagination is more important than knowledge.
–EINSTEIN

The best education consists in immunizing people against systematic attempts at education.
–PAUL FEYERABEND

It is almost a miracle that modern teaching methods have not yet entirely strangled the holy curiosity of enquiry; for what that delicate little plant needs more than anything, besides stimulation, is freedom.
–EINSTEIN

If you take a highly intelligent person and give them the best possible elite education, then you will most likely wind up with an academic who is completely impervious to reality.
–HALTON ARP

Nothing dulls the mind as thoroughly as hearing familiar words and slogans.
–PAUL FEYERABEND

Everyone is a genius is some realm. Our education systems support the genius of a few and destroy the genius of most.
–FRITZ ZWICKY

You cannot reach heaven with a tower of Babel.
–KURT GÖDEL

The task is not so much to see what no one has yet seen, but to think what nobody has yet thought about that which everybody sees.
– Schrödinger

We must periodically start over from scratch
paraphrase of
– Descarte.

ABOUT SCIENCE

Nature is not restricted by the imaginations of scientists.
–JOE WAMPLER

Science should be taught as one view among many and not as the one and only road to truth and reality.
–PAUL FEYERABEND

Science must be protected from ideologies; and societies, especially democratic societies, must be protected from science.
–PAUL FEYERABEND

External interference may be needed to overcome the chauvinism of science that resists alternatives to the status quo.
–PAUL FEYERABEND

Anarchism, while perhaps not the most attractive political philosophy, is certainly excellent medicine for epistemology.
–PAUL FEYERABEND

Anarchism must now replace rationalism in the theory of knowledge.
–PAUL FEYERABEND

There is no idea, however ancient or absurd, that is not capable of improving our knowledge. The whole history of thought is absorbed into science and is used for improving every single theory.
–PAUL FEYERABEND

There must be a separation of state from science and technology just as there is a separation between state and religious institutions.
–PAUL FEYERABEND

It is the primary responsibility of a scientist to face, and resolve, discrepant observations.
–HALTON ARP

Today science is failing to self-correct.
–HALTON ARP

The stronger the evidence against a consensus hypothesis, the more consensus attitudes harden.
–HALTON ARP

in SPIN

FRAMEPOW.WPD MAY 9, 2001

THE POWER OF THE FRAME

Across the valley from where I live is a solitary peak that rises above the horizon of low lying hills. When this peak is viewed through an opening in the branches of nearby trees, framed so to speak, it appears very large and dominates the field of view. When viewed a few feet away from a spot with no intervening trees, it shrinks in size and returns to its proper proportions with respect to its surroundings. [This effect is sometimes noted with the moon, and is called the "Moon Illusion"]. This phenomenon is not a matter of optical focusing but rather a matter of informational filtering. I introduce this as a metaphor for the effect of **framing** on the relationship of what is framed to its containing context.

Politicians are continually concerned with issues, and are especially involved with what they call "framing the issue": How to gain advantage by shaping or bending an issue in order to fix it in a particular way in the mind of the public. [This has the inevitable consequence that they quickly fall victims to their own manipulations, believing in the validity of that which they intentionally molded.]. Some examples:

GST1.WPD July 24, 2006

NOVTHINK.WS4 DISK ESSAYS1 BACKUP JUNE 13, 1988
REVISED 06/14/88 COGITANS

Donna points out a difference between von Bertalanfy's General System Theory and J.G. Bennett's Systematics: The approach of General System Theory is the search for commonalities which occur on one or more levels of abstraction between subject systems. For example, the star and the city, or Newton's moon and apple. Bennett's Systematics approach, on the other hand, represents a system by selecting a framework or template from a pre- constructed set of frameworks each of which parameterize a system. The members of the set are characterized by certain general attributes, such as the attributes of the natural numbers. For example, cybernetic or control systems, such as Jung's psychological functions, all share attributes of a four- fold framework. Actually G.S.T. and Systematics are not so much different approaches as steps in a sequence of operations. G.S.T. performs the step of establishing that two (or more) given systems may share the same abstract representations. Systematics performs the step of characterizing a system by identifying it with the best framework taken from a set of pre-established "canonical" frameworks. Which of these steps is first depends on the whether suitable reference frameworks pre-exist in the framework set.

A third step to complete the representation of systems is to imbed the frameworks of the canonical set in a system space. The Systematics approach has so far identified 12 or so frameworks associated with the natural numbers. In order to imbed this set into a system space the parameters indigenous to each framework must be used to isolate meta-parameters which can define the dimensions of the system space. Thus systems possessing commonalities, within the G.S.T. meaning, would lie in the same Hausdorf neighborhoods of the system space. Such a system space is similar to the Hamming spaces of coding theory, or to what has been termed cognition or information space.

The operations in characterizing systems are thus: 1) Identify commonalities between systems [G.S.T.]; 2) Identify systems with their proper characterizing framework [Systematics], (A step which may preceed step one); 3) Construct a "meta-framework" or system space relating the various canonical frameworks; 4) Compare and contrast systems on the basis of their locations in the system space; 5) Steps consisting of iterations of the above four. In step one we use the cognitive operation of clustering, in step two we identify or label the clusters by associating them with, or mapping them onto, a prescribed set of previously designated frameworks. In step three, the structuring of the system space, we are in effect creating a "system grammar" or a "system algebra". It is to be emphasized that the entire process must be iterated. There is no assurance that the set of cononical frameworks is ever complete or optimum. It is therefore subject to continual revision with the consequence that the system space itself is also incomplete and subject to iterative updating.

The fundamental cognitive operations involved in the algorithm are clustering, differentiation, structuring and iteration. Detailed operations include collecting (making laundry lists), placing in juxtaposition (comparing and contrasting, i.e. looking for commonalities and/or differences), sorting including filtering, representing or symbolizing, ordering and more complex

operations of structuring.

It is interesting that the creation of programming languages has advanced our analysis of epistemological process, such as the one described here, more in thirty years than has been achieved in 30 centuries. This is largely becaused we have been forced into the self-referential task of examining what we are doing when we think in order to communicate it to a computer. It has been said many times that we can automate anything we can articulate. Wherever we can describe our thinking with sufficient precision to "franchise" it, we can then delegate to the computer.

++

An iteration on the above ideas:

Consider the concept of ordering. We may, for example, order a list by "sorting" it, which in usual computer parlance means to place the list in ascending or descending alphabectial (or ASCII) order. The important point to note here is that before we can perform any ordering operation, the particular framework that corresponds to that order must pre-exist. Hence all of the structuring and ordering of which we are capable depends on the set of frameworks or organizing schemata which are available to us. Hence, the morphology of organizing schemata becomes a fundamental epistemological tool. Bennett's set of frameworks not only extends the set of available frameworks, but also self- references or makes visible those which have been commonly available.

From this comes the basic dichotomy (or possibly later the basic set of levels), of systems and frameworks. [It is interesting to compare this dichotomy with the dichotomy of particles and cells in statistical mechanics or combinatorial theory.] Returning to the beginning, before the commonalities of systems according to the G.S.T. approach can be ascertained, some set of system parameters must be at hand. While we may readily be able to perceive that A is like B in some respect or that A differs from B in some respect, the epistemological challenge is to articulate the parameters involved in the likeness and difference. Such a set of parameters is itself an organizing schema, albeit of a primitive sort. Thus our fundamental cognitive operations of association and differentiation depend on some pre-existing frameworks or set of recognizable parameters. Systematics is thus a hidden prerequisite to G.S.T. The presence of iteration again becomes visible. We may conclude that our thinking exists at some distance down a long sequence of iterations of certain cognitive operations. Since the order in which these operations are applied at any point leads to a somewhat different subsequent sequence, the path of our thinking is like our biological form itself, evolved in a series of choices, branches in the Tree of Life. [At this point we suspect the existence of four basic cognitive operations, corresponding to the four basic nucleitides.]

GENAB0.WPD April 1, 2007

ways out of the box

Abstraction

DIMENSIONS OF ZOOM:
- INCLUSION DIVERSITY
- SCALE FRACTALS
- TIME WIDTH OF NOW, DIACHRONIC | SYNCHRONIC
- ACCURACY PRECISE | FUZZY EQUATIONS | POEMS
- FREQUENCY
- COMPLEXITY
- ENERGY TEMPERATURE
- NUMBER OF ORTHOGONAL DIMENSIONS

GENERALIZATION W INVERSE DEFACETIZATION eg the great pyramid
LIN AND ABSTRACTION
THE FEYNMAN DIALECTIC

TIME IS AN ABSTRACTION TO ACCOUNT FOR THE VARIOUS SPECIES OF CHANGE

GENERALIZATION IS TO DISCOVER MORE DOTS
ABSTRACTION IS CONNECTING DOTS
- FINDING COMMONALITIES IN THE DOTS, IN PARAMETERS, IN PATTERNS

NEW PARADIGM ~ NEW BIGGER TABLE

DOT IS NON DIMENSIONAL ~ A VALUE IN A PARAMETER
A PARAMETER IS ONE DIMENSIONAL
AN ARRAY IS MULTI-DIMENSIONAL

A SET IS AMORPHOUS

MORPHOLOGICAL BOX IS A CARTESIAN ARRAY

seeing in a
≥2 dots as values ⇒ parameter
A parameter is :.

H. BATEMAN, a generalist, new dots results, an abstraction
finding source a linker of dots
Analysis, discrimination, for new dots
[VB also source of new dots]

E. T. BELL, an abstractionist, commonalities of sets, values ⇒ a parameter
Algebra, juxtaposing [~ translation of codes]
Or is this a 3D?

Generalization: showing something is a special case
by a new dot or parameter

A second meaning of generalization: gatherizing, elimination of distinctions
This kind of generalizing ~ semi-abstraction
to place into a single set
The essence of LawThink
seize on one commonality but retain some commonalities

~ Anderson:

Abstraction: elimination of some distinctions
finding <u>essential</u> commonalities
"absorb" special case

Generalization: more special cases
create
per discriminatory

Two emphases in thinking

Make discriminations → special case
Analytical
Analyzers
differencers
see commonalities / lumpers
Synthetic
Synthesizers
samers

3° if ∃ a difference
fight: destroy one
Remove the difference.
homogenize

4° Compromise
semi-synthesis

G → parts facts

A → wholes unity

reductionism: bottom up
special case
of generalizations

Templatism
∃ whole → parts

GENAB1.WPD April 1, 2007

ABSTRACTION vs GENERALIZATION PART I

A branch of Athroismatics

THE RULES VS SETS APPROACH:

1) Abstractions eliminate non-essential parts of the problem and focus on the concepts that are really necessary.
2) Abstraction shows that problems that appear to be different are essentially the same or have similar solutions. {[cf General Systems Theory]}
–James Anderson, Discrete Mathematics p 226

According to Anderson,
Abstractions use existing sets to extract their common rules or essences.

Say we have a set of elements or objects together with rules governing how they are to be combined. Generalization is about keeping the rules but adapting them to a wider class of objects, i.e. finding additional sets of objects for which the rules work. While the symbols may remain the same, their meaning becomes different.
–Feynman Lectures on Physics, Vol I, 22-3

According to Feynman,
Generalizations use existing rules to find other sets for which the rules can apply.
but that is abstraction

Abstraction is based on commonalities.
It is the lumping together of those special cases having common essences, principles, or rules into a "higher level" class The special cases become the elements of the abstract set.
Seeking and unifying existing commonalities.

Generalization is based on extending existing essences, principles, or rules to other sets of objects. Adapting to a prescribed set of rules.

According to the Rules vs Sets approach, both abstraction and generalization build on what exists. abstraction on existing sets, generalization on existing rules.
Neither break out of pre-existing patterns or processes.

Whichterm for which process

Definition of Abstraction from "Great Ideas that Changed the World" Book p. 276

Abstraction: "inferring universal realities from the common qualities of particular objects"

Thought

NUMBER [20]
SUBJECT [RULES]
TEXT [There are two sets of rules: one for the structure of the playing field and one for the game itself.
In football, for example, the size of the field, the location and heights of the goal posts, the 10 yard and out of bounds markers, etc
And for the game itself, rules governing passing and pass receivers, off sides, number of downs, field goals, penalties, etc

Every activity has both sets of rules. Politics, The Senate, Finance, Wall Street, War, Business, Medicine, Physics, even philosophy

Frequently the template or infrastructure rules become inadequate or over restrictive and the game becomes paralized. (Also known as a category crisis) Inversely with no template, no organized activity is effective or even possible.

de Sitter quote:
Principles differ from special laws, not only by being more general but they aspire, so to say, to a higher status then the laws. Their claim is that they express fundamental facts of nature, general rules, to which all special laws have to conform, and they accordingly exclude a priori all attempts at explanation by hypotheses or mechanical models.
]

THOUGHTS

NUMBER [18]
SUBJECT [ABSTRACTION | GENERALIZATION]
TEXT [Abstraction and Generalization are two ways of connecting, linking, relating.

Abstraction is about finding systems that follow the same rules.
Unity lies in the commonality of the rules---laws--principles
(Structuralist oriented)

Generalization is placing into the same set those elements that have common attributes or properties.

Thus abstraction is about behaviours, doing, and CHANGE
And generalization is about essences, being, and EXISTENCE
]

KNOWAY.WPD SEPTEMBER 9, 2001

THE WAYS OF KNOWING

SENSORY EXPERIENCE,, THE SENSIBLE

INFERENTIAL OPERATIONS,, THE THINKING

FEELING AND EMOTION,, GUT FEELING

INTUITION AND RECOGNITION,, TUNING IN recognition ~ revelation labeled

GLIMPSES also TUNING [SCANNING]

And all are inadequate both separately and in toto of creating a homomorphism of existence.

Jung and Yoga have explored the first four. The fifth is context to content, totally beyond our intentions or control, but it happens to those who can receive. [Fry Canyon, Utah]

Experiencing the visible [sensible] vs the invisible, the nodes vs the links or relationships

Thinking and logic are ways to construct the unseen relationships between the nodes[the visible]

The constructions are interpretations not necessarily accurate or true.

What is experienced must be ordered and retrievable in order to be knowledge. And perhaps recorded and communicated.

What are the channels and what are the vehicles and what are the transmitters and the receivers? Mind, brain, being, spirit, light, ?????

All modes operate at different time flow rates.

Knowledge and Existence

Descartes Cogito ergo sum Insufficient for existence.

The present thesis is that existence depends on at least two modes of knowing. Perhaps on more. [cf constellations, some exist some do not] two sensory channels or more or two or more modes.

MOTIVATE.WPD SEPTEMBER 3, 2001

ON MOTIVATIONS

Personal motivations and collective motivations

PERSONAL
Outer motivations: [Figure is personal, ground is collective]
Carrots motivation per reward Fame, power, wealth, security, liberty, control,
Sticks Motivation per punishment, guilt, shame, imprisonment

What motivates beyond reward or punishment?

Purely personal: pleasure, pain, anger, fear, ambition, conscience, freedom, hunger, sex
Inner motivations:
security, peace, duty, compassion, justice, happiness, hope, responsibility , calling
[Persist even when there is no hope –William the Silent]
understanding, curiosity, knowledge, mystery, glimpses
Closure and termination as motivations

Motivation vs Identity What is regarded as personal, what as collective? A spectrum
change, stasis

The reply to fame: Anonymity assures autonomy
The reply to wealth: Wealth is measured by the number and variety of options.
The reply to power: Power is availability to the Principle who has need for incarnation.

PREJUDICE

There are three basic sources of our prejudices: Behavior that deviates from our *norms*; values and opinions that differ from our *beliefs;*[1] and appearances or a constitution that differs from our *being*. We direct fear and hostility toward those whose behavior we do not approve. For example, these could be speeders if we are parents, or gays and lesbians if we are straight. . We direct fear and hostility toward those whose opinions and agendas we disagree with. For example, these could be gun control advocates if we are members of the NRA, or abortionists if we are right wing Christians. We direct fear and hostility toward those whose constitution and appearance is not like ours. For example, these could be those who are black if we belong to the KKK, or those who are female if we are members of the Taliban.[2] The common ingredient in all seems to be fear of what is different.

But 'fear of what is different' taken alone is not adequate to explain prejudice.
But in many instances fear of what is different is mitigated by familiarity. Those who are different in race can become close friends.

that is differences in being is not so important as difference in values. Ways of thinking. the invisibles, are much more difficult to adjust to. If not impossible.
The invisibles: values, way of thinking, religions belief systems world views
Both being and behavior are visible, but being is fixed and behavior is alterable
The number factor, the power factor (Cortez vs Moctezuma)
But prejudice can also be reinforced by **overload**, either variety overload or multiplicity overload. Prejudices occur especially when there are large numbers of that which is different. This can be from large numbers of a single different form or from large numbers of different forms. The first is multiplicity saturation and overload, the second is variety saturation and overload. However, when the saturation or overload is from high multiplicity of a single form, the result is unfocusable prejudice which manifests as rage. When there is but a small sample of the different ones, there is interest and curiosity rather than fear and prejudice.

overwhelmed by data

Prejudice is also a matter of generalization. What is a terrorist how to package that is how to define A definition is a package.

Prejudice depends on simplification and generalization is simplification.
I would not call Aristotle the first cowboy, but he is certainly the god father of the good guy /bad guy way of looking at the world. [There are some who would say he stole the idea from Zarathustra.]

---

[1]We could include a sub-class of those whose tastes differ from our choices.

[2]Then there is a shadowy uncertain ground of prejudice against those whose behavior is different but it isn't clear as to us whether the cause is choice or being (DNA) as in the example of gays and lesbians.

Not in Scrapr

WHENSET.WPD 2002-05-14

WHEN AN ELEMENT, WHEN A SET ?

Sources of the question

in the law: One of the central features of jurisprudence is the element/set question

- no belief vs assorted beliefs
- local standards as elements vs the internet
- the law vs the uniqueness of each incident
- The first amendment as a set

no belief as 2 interpretation a member of the set
or
as a not to the set

Sets

- groupings, clusterings to simplify decisions
- single parameter groupings vs multi parameter groupings
- sets of distinguishable elements vs. sets of indistinguishable elements
- Maxwell-Boltzman statistics vs Einstein-Bose statistics

Atheism

in epiontology the set of the repetitive vs the rare, unique
Science deals only with those events that can be assigned to the set of the repetitive
assignment to sets to simplify decisions
reduction to T/F, us/them, LXM

Taking a member of a set as not-set

Pulsing (as in traffic) a form of assignment to a set
Pulsed traffic flows faster than unpulsed or random traffic
Should pulsing be orderly [uniform] or random?

Relations of the unique to the random

-- a tautology

ONLY WHEN EVENTS CAN BE ASSIGNED TO SETS, CAN THE CONCEPT OF TRUE OR FALSE BE APPLIED. That is, isolated events in themselves are neither true nor false, it is only when by some mode of parameterization they can be assigned to a set, that they then can take on such attributes as true/false, exist/not exist, good/evil, etc.

True/False,, Good/Evil,, etc are not attributes of events or entities, they are attributes of sets.

The intrinsic variety in events does not permit them to processed by human logic. Consequently we assign events to classes to reduce the variety and make them tractable with our information processing capacities. That is, the world is too complex for us to treat without reduction of phenomena to sets and ultimately to dichotomic sets. Then such ideas as true or false can be applied. But ultimately such concepts as true/false, good/evil, existence/non-existence have no meaning.

Human thinking:

Step one: assignment to a set

Step two: seek parameters that reduce assignments to a pair of dichotomic sets, that is to two opposing sets. [the origin of 'not' in our logic]

Nul in Scrap 2002

WHENSET.WPD 2002-05-14

WHEN AN ELEMENT, WHEN A SET ?

Interchanging sets and sub-sets.
Sources of the question
in the law: One of the central features of jurisprudence is the element/set question
no belief vs assorted beliefs
local standards as elements vs the internet
the law vs the uniqueness of each incident
The first amendment as a set
Sets
groupings, clusterings to simplify decisions
single parameter groupings vs multi parameter groupings
sets of distinguishable elements vs. sets of indistinguishable elements
Maxwell-Boltzman statistics vs Einstein-Bose statistics
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Pulsing (as in traffic) a form of assignment to a set
Pulsed traffic flows faster than unpulsed or random traffic
Should pulsing be orderly [uniform] or random?

Relations of the unique to the random

Legal or illegal

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Step two: seek parameters that reduce assignments to a pair of dichotomic sets, that is to two opposing sets. [the origin of 'not' in our logic]

THE ACQUISITION OF CONCEPTS

One of the attributes of humans, differentiating us from other creatures, is our ongoing pursuit of new ways to view and cope with the world. However, we habitually handicap ourselves by assuming that what we experience discloses the actual nature of the cosmos. We extrapolate and generalize to other realms what our senses lead us to conclude from local experience. Although we have succeeded in extending our sensory apparatus with an assortment of instruments–telescopes, microscopes, sensors of the non visual EM spectra, etc., we now know that our natural senses, even extended, give us only a partial snapshot of what may exist. We must now accept that it is illusory to equate the particular world view based on our limited perceptions with any Cosmic Reality.

But it is not only the limitations in our perceptions that have rendered our experience a special case, it is that the feed back from our perceptions on our thought processes has biased our manner of reasoning. Our logic and reasoning have been derived from and molded by our perceptions, and have contributed to our illusions as much as have the perceptions themselves. It follows that an effort to extend our reasoning apparatus could be as useful as the extensions to our sensory apparatus have been.

The enhancing of our thinking is largely through the acquisition of new concepts which extend our basic units of thought. While some of our everyday concepts, such as *saving* and *storage*, date back to pre-antiquity, sometimes the capturing of a basic concept is a matter of centuries. This is because a concept may for years lie dormant in countless anecdotes until a pervasive commonality is noted. When this happens the essence of the anecdotes is abstracted and defined in a phrase or two. And finally, with increasing familiarity, the concept is reduced to a single word. As an example, for centuries a notion of energy was sensed but the concept of *energy* wasn't grasped and explicitly defined until the 19th century. In the 20th century we have discovered that the relative equilibrium of the natural order that has obtained in our times is not absolute. We have learned from fossil records and deposits of rock and ice that major changes and great catastrophes occur from time to time. This realization along with the rapid advance of technology in the 20th century has resulted in a most remarkable rate of acquisition of new concepts: e.g., *catastrophe theory, chaos theory, ecology, genotype/phenotype, information, software/hardware, critical mass,* etc, etc.. Our everyday thinking has yet to catch up with the enrichment, and correction, afforded by these concepts.

We must note, however, that some concepts resist definition and have remained permanently encapsulated in anecdotal form. For example, many of the stories of classical mythology contain basic concepts that have never been reduced to a hard definition. And it may be where there is a richness of interpretation a story is superior to a definition, for to define is to truncate. Our thought processes are more powerful when equipped with both precise concepts, and ambiguous notions. The former to guide our reasoning and the latter to feed our imagination.

A COGNITIVE MANIFESTO

The psychical entities which seem to serve as elements of thought are certain signals and more or less clear images which can be "voluntarily" reproduced and combined... This combinatory play seems to be the essential feature of productive thought - before there is any connection with logical construction in words or other kinds of signs which can be communicated to others... The above-mentioned elements are, in my case, of visual and some of musical type. Conventional words... here to be sought for laboriously only in a secondary stage, when the mentioned associative play is sufficiently established and can be reproduced at will. –EINSTEIN

Knowledge is the image of existence. FRANCIS BACON

2002#31

META01.WPD 2002-06-08

A COGNITIVE MANIFESTO

The critical tasks at hand are:

To detect the limits of human perception and cognition.
To identify the distortions and biases implicit in our perceptions.
Distortions are physical and biological [hardware]
Biases are cultural and societal [software]
The psychological is both hardware and software.
To identify the distortions and biases in our modes of thinking and reasoning.
Both those that are hardware and those that are software
Both those that are self deceptive and those implanted by spin masters.
To identify the issues underlying the visible issues.
To design and create alternatives for existing structures and processes.
And
To develop procedures to implement the above.

To liberate ourselves from all dogmas
From those of our religions, cultures, and traditions
From nationalism, racism, sexism, and all us/them isms.
From fundamentalism, scientism, and selective skepticism

To allow all alternatives to be on the table.
To develop evolving criteria for significating and prioritorizing what is on the table.
To develop criteria for developing the criteria.

To alternate specific to general with general to specific.[bottom up with top down]
To periodically update, upgrade, and recycle all knowledge.
To ultimately ~~shred knowledge~~ when correction is not possible.
[cf bio-extinctions]

To permit Brahman
To allow for the concept of truth, but hold that whatever we know is not truth, but at best only a special case.
To seek the totality of pictures of the cosmos, not declare one to be the whole.
If absolutes are needed, let them be subjective not objective.
Let them be to commitment, to courage, and to compassion.
to openness

NOTE15.WPD See update in scraps 2004 AF 63 October 5, 2004

ANOMALIES, ANTINOMIES, AND ARISTOTLE

Is it not possible that some of our exasperating antinomies are beyond resolution so long as we persist in that particular mathematics–the only one we have at present–which is based on Aristotelean logic? Will the difficulties ever be cleared up by traditional reasoning, or are they waiting for some new minds, not respectful of authority, to circumvent the contradictions by building inclusive mathematics on a many valued logic?

–E. T. Bell

(from The Place of Rigor in Mathematics, American Mathematical Monthly, v 41, 1934)

Today there are many who feel that no small part of mankind's problems and conflicts have been created by our way of thinking. What we think is determined and delimited by how we think. Many of the scientific paradoxes, legal anomalies, and political "Orwellisms" that have challenged us ~~since~~ in the past few decades can be attributed to our dyadic, "us/them" mode of thinking. If even mathematics is in trouble because of Aristotelean thinking, then it seems most important to extend Bell's questioning to a broader domain. Make them more inclusive by replacing the term mathematics in his quotation with the more comprehensive concept, mode of thinking. Hence:

Is it not possible that some of our exasperating antinomies are beyond resolution so long as we persist in that particular mode of thinking –the only one we practice at present–which is based on Aristotelean logic? Will the difficulties ever be cleared up by traditional reasoning, or are they waiting for some new minds, not respectful of authority, to circumvent the contradictions by building a more inclusive mode of thinking based on a many valued logic?

It should be noted that multivalued logics have been around for some time. Hindu thinking has long included certain species of four valued logic, for example allowing statements to be, True, False, Neither true nor false, Both true and false. In the West, before mathematicians began exploring multi-valued logics in the early 20th century, all was Aristotelean. Maybe, we should allow for an exception or two: Scottish courts allow in addition to guilty or not guilty, the option, not proven. And for our zero sum win/lose games, when overtime is inconvenient, we have allowed the third alternative of a tie. But Aristotle's rule in the West remains mostly unchallenged.

NOTE35.WPD November 18, 2004

UP DATED INTRODUCTION
To Styles of Thinking

The analyses of the recent election have centered not only on the candidates, their personalities and records, but on balloting, numbers of voters, minorities, vote counting, and voting machines. But looking beyond the mechanics of campaigning and voting, some analysts have studied the map with its red and blue areas and sought to explain the results on a psychological level in terms of fears, ideologies, and values. They hold that the vote reflects what people feel and think. That is tautological. The analyses should go further, beyond what people think, to how people think. When people have the same inputs but come to different conclusions, what they think must have something to do with how they think.[1]

Ideology may have as much to do with the "how of thinking" as with experiential inputs. Ideology is also influenced by "group think", our thinking conforms to what the majority of those around us think. We see on one side in the election, simplistic black and white thinking, the us/them, good/evil, style of thinking typical of one of the candidates. That this simplistic style of thinking was challenged by majorities in blue zones indicates that there do exist different kinds of thinking as well as different specifics in what we think. It may be that living in high density urban areas requires more sophisticated thinking, the need to come up with more alternatives, (e.g. the need to know alternate routes when there is freeway gridlock), than are required in red low density prairie lands.

> THE HUMAN MIND, EXCEPT WHEN GUIDED BY EXTRAORDINARY GENIUS, CANNOT SURMOUNT THE ESTABLISHED CONCLUSIONS AMID WHICH IT HAS BEEN REARED.
> -WINSTON CHURCHILL

Another factor revealed in the election is the role of certain religious beliefs. Whether the profound teachings of various religions have been intentionally "dumbed to the dyadic" in order better to control membership or have of necessity been designed to fit an existing low level of intelligence of the membership, the result has been millions of simplistic thinkers. My own persuasion is that simplistic thinking is not ingrained, it is inculcated. Of course, this paragraph raises another issue, the arrogance of elites who pretend to be able to analyze human thinking.

But we cannot tell the dance from the dancer
Can we tell the thinking from the thinker?

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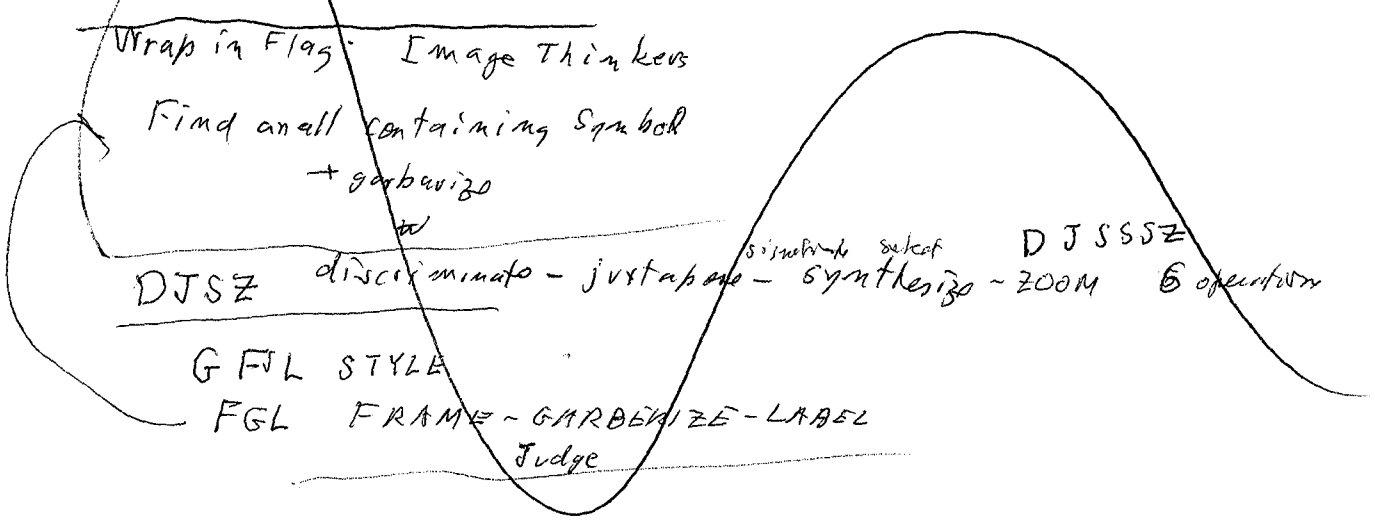
[1] It is certainly open to question whether voters in the red zone and the blue zone had the same inputs.

The other alternative is, the control types, "leaders" in govt, religion
— are power types, who automatically do dyad thinking



THINKERS OUTSIDE THE BOX

NICHOLAS OF CUSA

Nicholas of Cusa (1401-1461), a remarkable diachronic thinker. A century before Copernicus he claimed that the earth itself moved and that it was not at the center. Going beyond Copernicus he reflected modern cosmological thought when he said, "The fabric of the world has its center everywhere and its circumference nowhere." Relativity enunciated in the 15th century! In his treatise, Learned Ignorance, (1440) he said that the universe is neither infinite nor finite because there are no limits with which it is enclosed, that is, the universe is finite but unbounded. His cosmology not only foreshadowed relativity, his logic anticipated Gödel's Incompleteness Theorem, when he asserted that "reason is inadequate for determining truth". His logic was perhaps the earliest non-Aristotelean logic in the West. "It both is and is-not, but it is also neither is nor is-not."[1]

KURT GÖDEL

Kurt Gödel, greatest logician of the 20th century, famous for his Incompleteness Theorems, in which he proved the intrinsic limitations of axiomatic systems, felt that stories were the best devices for grasping truth. He stated, "Only fables present the world as it should be and as if it had meaning."[2] He saw stories as going beyond logic and equations in conveying *contexts* which are required as well as *contents* for communicating meaning. He implies that meaning is primarily about humans not reality.

PAUL FEYERABEND

The scientific philosopher, Paul Feyerabend, a 20th century thinker in the forefront of interpretations of modern physics, agreed with Gödel. He asserted that "A systematic analysis is a fraud. So why not avoid the fraud by going directly to stories."[3]

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[1] World Book

[2] A World Without Time, Palle Yourgrav, p5

[3] Killing Time, Paul Feyerabend, p163

MAY2505.WPD May 25, 2005

THOUGHTS ON MAY 25, 2005

COGITANS

In our thinking we separate what is inseparable:
- Creator and Creation
- Designer and Design
- Selector and Selection

We fail to relate what is related
- Process and Product
- Option and Action[1]
- Form and Force

And we homogenize what is distinct.

IDENTITY

The technological changes of the past two centuries have rendered obsolete our way of looking at the world. Not only are our ways of thinking obsolete, but our continuing to inculcate them in our children has created an impending cultural crisis: A culture becoming incompatible with its environment and oblivious of its trend to self-destruction. Our collective identity has become local and synchronic. We connect with what is immediately contiguous, and with what is current and continuous. We either ignore or are unaware of the broader contexts essential to our actions and our survival. In remedy, there has been a call for "reentification", which means the depackaging of our traditional and current associations between the elements of our experience and coming up with alternate connections and patterns more isomorphic to the real nature of the world we inhabit. This requires a revolution in our way of thinking, in our way of organizing, in our way of evaluating. Such a revolution would not only revise our educational system, but many of our other basic institutions–legal, political, commercial, and even religious.

In the present world order we find that the major decisions are being made by people totally unqualified to make them. The important decisions in today's world involve complex technical, economic, and ethical issues. And those making the critical decisions lack the technical, historical, and philosophical backgrounds needed for meaningful resolution of the issues. At an earlier period legal training was held to be sufficient for doing legislation. This is no longer the case. In fact legal training, how to think like a lawyer, is deleterious to useful decision making in today's world. But worse, the psychological types of people attracted to political power are exactly those who should never hold political power. (Even those of this species see the truth of this in an extreme case such as that of Bolton). Noteworthy, over 2500 years ago, Confucius came to the conclusion that "those who desired political power should automatically be disqualified.

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[1]This trade-off may also be stated as: Insight vs Movement, Awareness vs Focus. In general. Action takes two forms: movement or selection.

PACKLABL.WPD September 26, 2005

PACKAGING AND LABELING

This subject applies to the laws of aggregation, the laws of change, to logic, to science, to theology, to psychology, to sociology, to economics, and in fact to just about everything.

PACKAGING:

In the course of bio-evolution–selection becoming selector–there is convergence to a set of species or gene packages. These packages co-exist, either symbiotically or competitively, but after living together over a period of time tend to become organized in some form of "pecking order". And this pecking order in turn becomes ossified restricting change and further evolution. As both cause and consequence of this ossification, the "top species" decides it wants to replace the cosmos' basic ontological rules with its own views and rules. But it happens that one of the cosmos' basic rules is never to allow this to happen. And it prevents this from happening by providing for the fragmentation or depackaging of all ossified orders. In the annals of paleontologists, these fragmentations take the form of extinctions and radiants. In the records of historians, depackaging has occurred from wars, revolutions, and natural disasters. But in every case, some major change in **context** takes place resulting in the displacement of the well adapted, "the winners", and allowing the depackaged pieces to reorganize in a new way. This is one of the fundamental **laws of change**.

We are not conscious of many of the things that have become packages in our thinking. For example, the Bible has become a package for many. While the scriptures are writings from many sources over several centuries, many people hold that the selections packaged by certain committees seventeen centuries ago constitute an inviolate package. There are also several packaged political beliefs–conservatism, liberalism, and economic beliefs–capitalism, socialism. These packages inhibit the filtering and selection of the useful and valid from the useless and obsolete. And virtues and values have been packaged so that loyalty must always be to policy and courage only with military action.

LABELING:

While the labels assigned to species have little meaning in bio-evolution, labels play an important role in social and cultural evolution. Labels dominate our thinking about race, religion, and politics, and influence the way we think about most of the inanimate objects we live with. Labels bundle the rich diversity of the world into a small number of tractable packages in order to accommodate our limited information processing powers. Packaging and labeling are the primary tools of advertisers and the WMD[1] of spin doctors. In fact, labels have become the bonds that create a society and formulate its world view. But beyond just packaging, labels tend to divide the world into good/evil, winners/losers, us/them. And some labels–democracy, freedom, peace, justice, have become so vague and orwellian that their original meanings have disappeared.

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[1]Weapons of Mass Deception

THINKTYPES.WPD March 10, 2006

FOUR SPECIES OF THINKING

SCIENCE APPROACH:

Focus on confirmed facts [confirmed meaning repeating or reproducible by experiment]
Focus on the "IS", what is out there, objective, value free.
[But now being modified by recognizing observers' participation]
True/False, Aristotelean view being replaced by a probabilistic view,
[But allowing Popper falsification]
Skeptical and uncertain, open to modification and correction, never final; If can, then do.
View of others: General unconcern, but toss them a few apples now and then.

LAW APPROACH:

Focus on selected facts [what advances winning the case]
Selection of inputs; control both what is admitted as evidence and who can be a witness.
[Use of ad hominems to discredit witnesses and to disallow inputs]
Interchange sets with subsets and exclude contexts to advance chosen views
Wording of law overruling intent of law, i.e. symbols replace substance.
Homogenize circumstances to subject them to the law.
Stasis oriented, certainty is established by precedence
View of others: They must be controlled. and protected

POLITICAL APPROACH:

Focus on images and illusions [What appeals to and entertains the public]
Project infallibility and pseudo certainty using PR, spin, and Orwellisms
Believe in yourself and your agendas, insulate policies from facts and contexts
Power of office allows you to create reality. i.e. "Might makes Right"
[but we have fought wars against "Macht geht vor Recht"]
View of others: The public are sheep to be led and homogenized into lockstep.

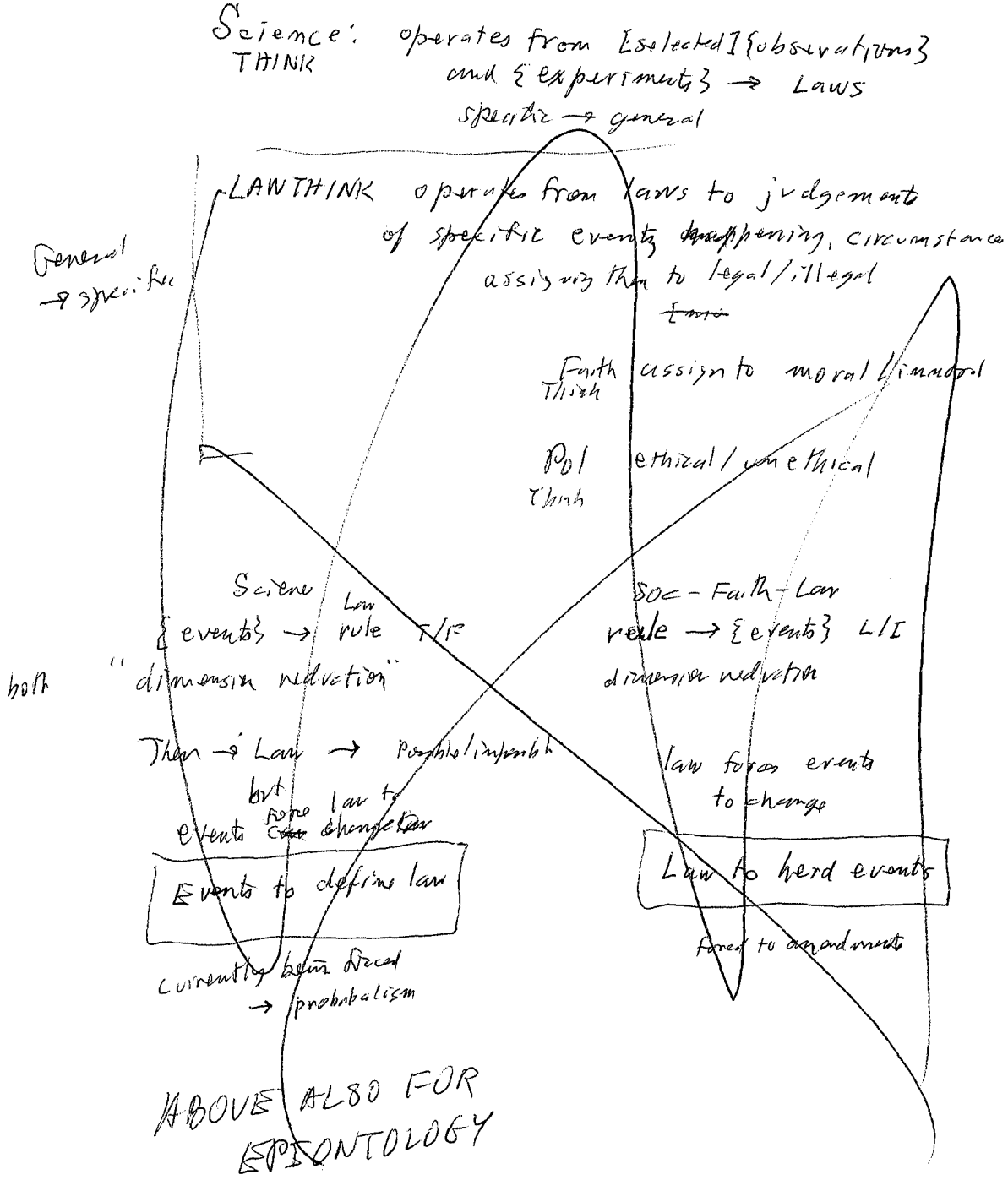
FAITH APPROACH:

Focus on the belief system, on its description of the world.
Focus on direction, ignore current position
Have absolute certainty in the correctness of the vision. Wish can subdue reality.
Diversity is dangerous. It creates uncertainty
["We are the ones, the chosen few, The rest of you are damned,
There is plenty of room in Hell for you, We don't want Heaven crammed.]
View of others: They are unwashed and must either be converted or eliminated.

Add MEDIA APPROACH

Focus on the narrowest synchronic

All of the above justify the use of various cognitive filters, sieves, and nets to select what dots are on their table of discourse. And all of the above restrict inputs because of inherent limited information processing capacity


Science: operates from [selected] {observations} and {experiments} → Laws
THINK
specific → general
LAWTHINK operates from laws to judgement of specific events happening, circumstance assigning them to legal/illegal
General → specific
Faith Think assign to moral/immoral
Pol Think ethical/unethical
Scien Law
{events} → rule T/F
Soc - Faith - Law
rule → {events} L/I
dimension reduction
both "dimension reduction"
Then → Law → Possible/impossible
but law to
events force change
law forces events to change
Events to define law
Law to herd events
forced to amendments
currently being forced → probabalism
ABOVE ALSO FOR EPISTOLOGY

TELINT.WPD February 9, 2006

TELESCOPES AND INTELLIGENCE
SOME METAPHORS

TELESCOPES	INTELLIGENCE
Light gathering power: photons/second proportional to the lens or mirror diameter squared	Data processing power: bits/second proportional to the number of parameters in the database squared
Magnification range: Wide field to high detail ratio, (measured by lens focal length to eyepiece focal length ratio)	Identification range: Big picture to detail discrimination ratio
Direction positioning: Two coordinates, declination and right ascension	Thought positioning: Two coordinates, concentration and attention span

The overall power of a telescope is seen to depend on its size, focusing range, and steadiness in tracking objects. There is also the matter of selecting which objects to observe and knowing when best to observe them. In addition there are contextual parameters , such as atmospheric turbulence and sky darkness, that affect overall telescope power and usefulness.. Finally, the usefulness of a telescope depends on how the results of the observations are integrated with other observations and with the theories that attempt to synthesize all observation.

Overall intelligence depends on the amount of data one is able to process; on the flexibility in moving between details and big pictures; and on how big a big picture can be entertained and what detailed discriminations can be perceived. Intelligence requires criteria for establishing priorities and selecting which ideas, concepts, problems and issues to engage, and the timing. Effective application of intelligence requires insight into contextual parameters such as differences in cultural thinking and values and what is changing and the rates of change. Finally, intelligence is measured by the ability to see new patterns in the data with imagination and openness replacing ideologies and dogmas.

ORDER01.WPD February 14, 2006 March 2, 2006

DRAFT THOUGHTS ON THE CREATION OF ORDER

A central problem that has engaged humanity over millennia is how to put our experience into a meaningful order. This task is rendered complex because only a portion of our experience is sensory, manifest to our senses. While objects and things may be perceived, the connections and relations between them are not manifest and must be inferred from theories and constructs devised for this purpose. Ordering or organizing thus requires both the operation of fabricating a set of possible linkages or modes of connection and then, using these linkages, the operation of constructing patterns with the things and objects that are directly perceived. In other words using hypothetical linkages to arrange the dots of observation in as many patterns as possible. But there is a constraint. The patterns must conform to certain subjective criteria of what humans intuit constitutes order or orderliness. This is usually Occam's criteria of simplicities.

So first, human experience is filtered by human sensory apparati, then organized according to human notions of order. Humana assert, or at least hope, that their constructs of order will be isomorphic to a predicated order in the natural world. But whether human symbolic constructs are isomorphic to the natural order or just projected on it is uncertain. The test of predictability has been adopted to separate the isomorphic constructs from the projection constructs.

Force is probably primary to form. Forms result from the interaction of forces. And changes in form, [eg position, velocity, shape,etc] are due to forces. When in balance forces create stable forms, when not in balance the forms move, grow, evolve, change.

FORCES <-----> FORMS, or B-SPACE <----> H-SPACE

{forces} create the dots;.

The Linking of nodes is in effect the creation of higher order nodes.
So we may conclude that sets of forces both create and link the nodes. A force is thus both a cause and a bond.
The paradox is that humans hold forms to be primary and take forces to be attributes of forms. This is because our primary experience of the world is vision and vision focuses on form, it does not perceive force. For humans the manifest are the forms, the dots, and these are held to be primary. But in the cosmic order the forces are primary. This has caused humans to resort to "reverse engineering" in order to explain the content and activities of the world.
Paradoxically, we have concentrated our theories on the nature of the unmanifest forces, and have not sufficiently studied the manifested forms. [There is more flexibility in the speculative than in the specified.]

GENITANS	COGITANS	ORDINANS
creating	symbolizing	organizing (collecting)
innovating	representing	ordering
inventing	matching	frameworks
discovering	rules	fitting
	anecdotes	selecting

← diachronic actions

Don't forget also
ADMA FormDMA
TDMA
CDMA
FDMA

All human activities but the world, cosmos may also be placing genitans ordinans and cogitans

representations of a more profound, abstract order-process

FUTRTHNK.WPD October 19, 2006

FUTURE THINK

Version 2

Past: Survival per control
Now: Survival per diversity

1. Four value and probabilistic logics
   Plus logic as a function of time

2. Synthesis replacing Eristics
   Contexts disabling Disputes, Search replacing Fight

3. The Middle Way: Convergence | Divergence balance, Diversity treasured not just tolerated
   Plures ex uno | E pluribus unum, Ecology replacing Sovereignty

4. Alternative multi-parameter infrastructures and schemata
   Both contiguous-continuous and discontiguous-discontinuous
   Meer Illusion

5. Consistent and Coherent sub-domains and zones. "Everything is a special case"
   Beyond monolatry, no one picture, no universals

6. Priority of the diachronic over the synchronic
   Control of "width of now"

7. Availability of both isomorphic and auric semiotics
   Need for both precise and vague representations, both equations and poetry

8. Connectivity by Abstraction rather than Generalization
   Generalization ~ belonging
   Abstraction ~ sharing
   Multi-level connectivity vs single level connectivity

9. Engagement Two level problems on both levels: Prevention of disease and cure of disease.
   approaches
   SYMPTOMS
   Poverty and the poor, Terrorism and terrorists, Set and elements

10. The recognition of quasi-life and pseudo-life.
    Fires
    Institutions and Organizations as quasi-life forms, Storms as pseudo-life forms

EXPERIENCE 1° PERCEPTION
2° PROCESSING

VERSION 1. 06-10-18

FUTUREKIND?

to SHARON ROCHER

1. Will think with a new LOGIC.
Old thinking based the "law of the excluded middle" (either 1 or 0)
New logic based on a melding of Buddhist/Hindu 4-value logic and quantum probabilities.

2. Will utilize a new type of SYNTHESIS.
A post-modern Hegelian version where both thesis and antithesis will be shattered to allow the emergence of a new synthesis from the disparate pieces.

3. Will create new OBSTACLES to convergence.
Ex. Separation of powers

4. Will create alternate SCHEMATA.
Alternate frameworks on which to arrange the dots. Finds different perspectives to be utilized for organizing data. Ex. Hypertext

5. Will perceive everything as a SPECIAL CASE.
The Universe cannot be described in a single schemata. Realizes that at some levels things fit, but on other levels not.

BACON'S IDOLS UPDATED

> *"38. The idols and false notions which have preoccupied human understanding, and are deeply rooted in it, not only so beset men's minds that they become difficult of access, but even when access is obtained trouble us in instauration of the sciences, unless mankind when forewarned guard themselves with all possible care against them."*
> –Francis Bacon Novum Organum First Book

Unfortunately, even though forewarned four hundred years ago, humankind is repeatedly entrapped in the four defective modes of thinking which Bacon labeled, *Idols.* A current example: Twentieth century cosmologists have adopted the so called Cosmological Principle which asserts that the universe is everywhere as it is locally. It infers that local measurements of the fundamental constants of physics are their correct universal values And while the Cosmological Principle might simplify the universe for modeling purposes, there is no evidence that laws of nature derived locally operate in the Andromeda Galaxy, two million light years distant, or two million light years before the present. This questionable principle could fit into any of Bacon's four Idols. But there are countless more everyday social, political and religious Idols that go unchallenged because they have become cultural cornerstones.

Francis Bacon), (1561-1626), English philosopher and parliamentarian , felt that the methods advanced by Aristotle for acquiring knowledge, and natural law in particular, were too limited. In his treatise, Novum Organum, Bacon proposed to replace Aristotle's syllogistic deductive approach with an inductive–empirical approach termed "enumerative induction", which has evolved into our present day scientific method. But he felt that before induction, or any epistemology, could achieve valid results there were basic flaws in our ways of thinking that must be acknowledged and corrected. He listed these cognitive flaws, preconceptions and prejudices, under four "Idols", which he labeled, Idols of the Tribe, (idola tribus); Idols of the Cave, (idola specus); Idols of the Market Place, (idola fori); and Idols of the Theater, (idola theatri).

I. Idols of the Tribe:

> *41. The idols of the tribe are inherent in human nature and the very tribe or race of man; for man's sense is falsely asserted to be the standard of things; on the contrary, all the perceptions both of the senses and the mind bear reference to man and not to the universe, and the human mind resembles those uneven mirrors which impart their own properties to different objects, from which rays are emitted and distort and disfigure them.*

These are projections of our own desires, wishes and purposes, including the projection of the concept of purpose itself, onto the natural order; which result in our repeated attempts to explain phenomena in terms of final causes. This idol includes the assumptions we make regarding the adequacy of our sensory apparatus for ascertaining, directly or indirectly, the significant facets of the natural order. It also includes a belief in our own primary importance in the natural order. A recent example is the so–called "Anthropic Principle", which holds that the universe was created exactly the way it is in order that we humans could be here. While this has long been basic in theological thinking, it has now surfaced in scientific thinking.

II. Idols of the Cave or Den:

> *42. The idols of the den are those of each individual; for everybody (in addition to the errors common to the race of man) has his own individual den or cavern, which intercepts and corrupts the light of nature, either from his own peculiar and singular disposition, or from his education and intercourse with others, or from his reading, and the authority acquired by those whom he reverences and admires, or from the different impressions produced on the mind, as it happens to be preoccupied and predisposed, or equable and tranquil, and the like; so that the spirit of man (according to its several dispositions), is variable, confused, and, as it were, actuated by chance; and Heraclitus said well that men search for knowledge in lesser worlds, and not in the greater or common world.*

This idol includes those personal prejudices that inadvertently enter into our thinking. These are generalizations from the personal to the collective: *as I am, so must others be.* These are generalization from the local to the universal: *as it is here, so must it be everywhere*. But whether collective or individual, whether assigned to the tribe or to the cave, the concept of universals is an idol. And while "as above so below" may be a great truth, its opposite is not.

from anecdote to universals

Projection not known to Bacon

III. Idols of the Market Place:

> *43. There are also idols formed by the reciprocal intercourse and society of man with man, which we call idols of the market, from the commerce and association of men with each other; for men converse by means of language, but words are formed at the will of generality, and there arises from a bad and unapt formation of words a wonderful obstruction to the mind. Nor can the definitions and explanations with which learned men are wont to guard and protect themselves in some instances afford a complete remedy; words still manifestly force the understanding, throw everything into confusion, and lead mankind into vain and innumerable controversies and fallacies.*

And Bacon did not foresee the profession of spinmeister, who intention was to create confusion using words to create reality

Semiotics, language, code books
distortions and truncations, one word many meanings One concept many words

IV. Idols of the Theater:
heritages, traditions, customs,

V product replacing process
VI convergence

What are the overall implications of the idols?

We can never ascertain the truth, there is no truth

There is no certainty

Convergence is a dead end

Divergence is a menu, we select, then converge

widely different ratio, such as the micro world of quantum mechanics or the universe itself.

OLDTHINK.WS4 DISK: ESSAYS1 03/05/88

This year, being an election year, there are many excellent opportunities to study pathological thinking. Flawed thinking assumes several forms, but can be classified as possessing two major categories: intentional or ignorant, criminal or stupid. Most hold knaves to be the greater evil, but some such as Metternich, hold the fool to be the greated menace: "It was worse than a crime it was a blunder". Even in a world without any bad guys, the inherent stupidity, ignorance and naivety of the good guys can do us in.

Sir Francis Bacon in his famous Novum Organum published in 1620, organized many of the pitfalls implicit in human thinking into four categories he called 'idols'.

Idols of the Tribe:

These have to do with those attributes of our perceiving and thinking which are bio-rooted and common to all. These involve the limits, filters, and distortions of our senses which "...bear reference to man, not to the universe".

Idols of the Den:

The distortions and flaws peculiar to the individual, in which we all differ. These are due to our background, training, education. They are our personal idiosyncrasies.

Idols of the Market:

The limitations and distortions imposed on us by language, the inadequacies and miscommunications of words. They "lead mankind into vain and innumerable controversies and fallacies".

Idols of the Theater:

The distortions, slants, biases imposed by our dogmas, ideologies, and all to which we give implicit credence. The plays we act in, the games we play in are confused with reality, "...creating fictitious and theatrical worlds".

[cf. Feynman and the Challenger Disaster Committee. NEWTHPRO.WS4]

Idols of the Theater are rooted in our belief systems. An incorrect belief system in time just does not work, whereas a fixed or closed belief system leads to stagnation and depression. But all belief systems are either wrong, or the contexts change, causing them, sooner or later, to become ineffective. So we have no choice, we either change or become dysfunctional.

Although Novum Organum and the Idols appeared in 1620, even today few have been able to perceive their own entrapments in the Idols. We like to think if we know about a trap we will be able to avoid it [the Major Simons Effect], but when the trap involves something intimately self-referential we refuse to see it.

SOME OF BACON'S IDOLS OF THE TRIBE:

o We suppose more order and equality than exists. We smooth and ignore irregularities.

o Once a proposition has been accepted everything else is forced to add fresh support and confirmation. We reject what does not conform with our first conclusion, we observe the cases of fulfillment, pass over those of failure though they be much more common.

o Human understanding is more excited by the affirmative than by the negative. But in establishing any valid axiom, the negative is the more powerful. [cf. Karl Popper]

o Human understanding is most excited by that which strikes and enters the mind suddenly. [cf. frog boiling and the definition of information] SHANON's

o Final causes (goals) are the mark of immaturity.

o Our findings are tinctured by our preferences [and interests].

o By far the greatest impediment and aberration of human understanding proceeds from dullness, incompetence, and errors of the senses. The sense of sight dominates our world, consequently we give no weight to the invisible.

o We suppose that which really fluctuates to be fixed. [pulsars]

o It is better to disect than to abstract [science vav math]

o Forms are a fiction of the mind.

SOME OF BACON'S IDOLS OF THE DEN

o Some primarily observe differences, others resemblances

o Some love antiquity, others novelty

o Some focus on particulars, others on generalities

SOME OF BACON'S IDOLS OF THE THEATER

o Sophistics Aristotle corrupted natural philosophy by logic.
Empirics Alchemists discours on everything in terms of their experiments. or Building a worldview only on the Book of Genesis.
Superstitions

o The disputatious school entraps the understanding; the poetical school flatters it.

o Those who decide hastily, render knowledge absolutist and dictatorial; those who decide slowly introduce skepticism.

Authoritarianism subdues the understanding;
Skepticism enervates it.

SINCE BACON

* With the unknown, one is confronted with danger, discomfort and worry. The first instinct is to abolish these painful sensations. So the First Principle: Any explanation is better than none.

The search for causes is thus conditioned by and excited by the feeling of fear. The question, "Why?" is not pursued for its own sake, but to find a certain kind of answer. An answer that is pacifing, tranquilizing and soothing.

Friedrich Nietzche in "The Twilight of the Idols"
Quoted by R.A.Wilson in "The New Inquisitors"

DEVICES THAT KEEP A BELIEF SYSTEM CLOSED (cf COGNITIVE THERAPY)

* All or nothing thinking
* Over generalization
* Denial and other mental filters
* Emotional reasoning
* Automatic thoughts

CURRENT IDEAS LEADING TO ILLUSION, SELF-DECEPTION, HYPOCRACY, DISEASE

COLLECTIVE AND PERSONAL

NOT INVENTED HERE
LABELISM
ONE SET OF RULES FOR ME, ONE FOR YOU
MASTER RACE ELITISM
FINALISTIC LOGIC
NEED FOR AN ENEMY
IOD FEEDBACK
ACTION AT A DISTANCE
MIXING LEVELS
JUSTIFICATION FOR NON-ACCOUNTABILITY
ALL OR NOTHING THINKING
OVER GENERALIZATION
DENIAL, MENTAL FILTERS
MAGNIFICATION/MINIMIZATION~

NEONTOL1.WPD November 18, 1999 #34

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.)

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 babushka 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 babushkas, boxes, Burgesses and seek some undiscovered fixed and/or variable parameters that would demonstrate, say, 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, etc. [whatever]

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 notions that are perfect nonsense under 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.

EXMID.WPD NOVEMBER 11, 2000 #69

PART I 1999 # 54 NOVEMBER 18, 1999

EXCLUDING THE EXCLUDED MIDDLE[1] PART II

As the year 2000 presidential election in the United States moved toward a fulcrum, a near balance in number of votes between the two contenders, we began to experience the disappearance of the excluded middle. At a fulcrum the option space changes. No longer are the options restricted to those allowed by Aristotle's law of the excluded middle, either [A] or [B], the options suddenly meaningfully include the "illogical" options [both A and B] and [neither A nor B]. The pundits and deans of law schools are calling the vote situation "uncharted territory", and are searching for precedents to guide decisions. It is true that being on a fulcrum is uncharted territory for western logic. But the fulcrum, the place where the interface between contraries is located, is the domain of emergence. At the fulcrum it is possible to transcend Aristotelean polarization. Going beyond [A] and [B] it becomes possible either to synthesize a position from selected components of both A and B, (this means more than negotiation or compromise), or allow the injection of an innovation that completely rejects both A and B. Either of these options lead to emergence. At any fulcrum the choices change from {[A] or [B]} to {[E] or [P]}, where [E] stands for emergence and [P] for continued polarization. Or, put in another way, the choice is to reject or to retain the law of the excluded middle.

From dynastic conflict to business competition human history is centered on an [A] or [B] dyad. Both Zarathustra's theology, the basis of western religions, and Aristotle's logic, the basis of western science, establish a dyadic world view. (Perhaps we should ask, Is a multiplicity of choices beyond two an overload on human information processing capabilities). However, whenever a pair of dyads is put into juxtaposition, (called elsewhere a "cross-dialectic"), the law of the excluded middle is circumvented, and some form of emergence results. (One example is the simultaneous occurrence of the Ptolmaic-Copernican dyad and the Luther-Vatican dyad, resulting in the viability of the reformation, another is the demise of the USSR, destroyed by an economic vs, cultural cross- dialectic). Alternatively, sometimes the positioning of [A] vs. [B] diverts attention from the fact that A contains B or that B contains A. In either of these instances the law of the excluded middle has already disappeared, and some form of emergence is under way. And what emerges in these cases is monopoly, where there is an image of [A] vs. [B] obscuring the reality of A is B. But on a fulcrum this smoke can be seen through.

Conclusion: Business as usual is secure so long as the law of the excluded middle is firmly in place. However, when circumstance leads to a fulcrum, there is a crisis for the [A] vs.[B] dyad. What ensues after encountering a fulcrum is either a revised polarization, between two re-aligned contenders, or an emergence which could be an unpredictable innovation.

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[1]The law of the excluded middle is that of Aristotle's logic, the logic of the western mind. Succinctly, it states that a proposition is either true or false, a person is either guilty or not guilty, an object is either here or there [not here], an event either happened or didn't happen, an entity either exists or does not exist. There is no middle ground. No other alternatives are possible.

THE ILLUSION OF THE EXCLUDED CONTEXT

I recall on numerous occasions, in many classrooms, in many courses, in many different subjects, the professor beginning his lecture by stepping to the blackboard and drawing a large chalk circle. "Consider the system," he would begin, addressing what was being written inside the circle. When first experiencing this approach, I felt the professor was using the chalk circle to get us to focus our attention on what he was writing in its interior. But somewhat later I began to realize that the chalk circle was a device to magically exclude the effects of everything that existed outside the circle. This made everything so much simpler, allowing us to ignore what we wished regardless of whether or not it could be ignored. The chalk circle approach, inculcated in us by our educational institutions at all levels, has become a basic tool in our mode of thinking about everything from economics to astrophysics. [In science it takes the form of selecting certain parameters to be held fixed, observing the variations of other parameters, and ignoring the rest.] The Illusion of being able to eXclude the effects of Contexts [IXC], together with strict adherence to the Law of the Excluded Middle [LXM] have created wastes, disasters, and absurdities in human society.

> WE SHALL REQUIRE A SUBSTANTIALLY NEW MANNER OF THINKING IF MANKIND IS TO SURVIVE. -Einstein

It is not only the attempt to ignore context, but ignorance of the multi-dimensional nature of context that creates erroneous conclusions. In two dimensions, on the blackboard, we might hold that the chalk circle insulates its interior from the exterior, but in a universe with larger numbers of dimensions than the blackboard, security from context based on a two dimensional insulation is an illusion. Thinking that ignores the context of the past [eg the Balkans], of the future [eg whaling, lumbering, depletion], of the micro [eg genetics], of the macro [eg asteroids], of invisible links [eg cartels, mafias], of secondary forces [eg wind, the Tacoma Narrows Bridge], of ego and arrogance [eg the Titanic], of symmetries [eg tit for tat], and of example [eg violence on TV, White House interns] will not solve problems. Today we see "blackboard two dimensional thinking" in our approaches to energy, health care, education, justice, defense, whatever. Each of these areas are linked to the others, not just through the budget as politicians choose to think, but in their interactions through each of the many contexts.

Many of the disagreements in current society derive from which context should be given priority over the others. These disagreements result in one parameter decisions made by courts, cartels, and congresses, and in response there are counter suits, protests, and terrorists. It happens that there exist algorithms for optimizing multi-parameter systems, no need to select which context, include them all. But employing such algorithms would put lawyers and politicians out of business, and the agendas of special interests would be impeded. .

It ain't gonna happen.

for LXM

WARPEACE.WPD October 5, 2006 rev November 6, 2006

WAR AND PEACE

The law of the excluded middle no longer applies to the conditions traditionally termed war and peace. We can no longer say that we are at war or we are at peace. Current relations between nations and the nature of modern weapons force upon us conditions beyond the two-fold Aristotelean True of False, War or Peace. We now also live in conditions that might be called both war and peace and neither war nor peace.

An early twentieth century example of this is when WWI ended on the Eastern front the Soviets signed the peace treaty of Brest Litovsk with Germany. Although the Germans had signed the peace treaty they continued to invade further into Russia. The Red government was at a loss, they wanted peace, but had to resist. Trotsky solved the problem by declaring that a condition of both war and peace existed.

When Mussolini joined Hitler declaring war on France and Britain on June 10, 1940, President Roosevelt decreed a change in the status of the United States from neutrality to **non-belligerency**, that is, a condition of both war and peace.

While WWII was clearly war and clearly stopped when surrenders and peace treaties were signed, the so called Cold War between the Soviets and the West was not a declared war, nor was it peace, it was better termed, neither war nor peace. There was no violence, but violence could occur at a moments notice. The situation was mutual deterrence. And it may be useful to label deterrence, neither war nor peace.

If we consider violent action without a formal declaration of war as a condition to be called both war and peace, then Israel and Palestine have co-existed in a state of both war and peace for decades.

The 2002 preemptive invasion of Iraq by the US was an officially declared war which supposedly ended after three months with a proclamation of "mission accomplished". But "shock and awe" did not accomplish the mission, instead it converted a war into both war and peace. So it was quickly announced that we were at a war which might last for decades with mission possibly never to be accomplished. And that is a good definition of both war and peace. And that is exactly the conflict situation adopted by the terrorists with their attack on 9/11.

William Lind has called the war against terrorists "fourth generation warfare". It is random on and off strikes at random targets with random weapons at random times. So perhaps the best definition of terrorism or fourth generation war is both war and peace. We conclude that experience in the 20th and 21st centuries has taken us beyond the law of the excluded middle with respect to war and peace. –And perhaps in logic too.

REGREC1.WP6 December 9, 1994 February 11, 1995

ON RECOLLECTION AND RECOGNITION

Recollection moves from the present to the past, into "M" or memory, i.e. something from the past that has been stored is retrieved, recalled. Let us say that recollection is an operation originating with present consciousness that searches the past for specifics and details, tracing the path to the present.

Recognition, on the other hand, seems to be forced upon us. It originates in some unknown source, "Q", and invades our present consciousness. Recognition, is devoid of detail, except that some present configuration or pattern stimulates a feeling of familiarity, deja vue, though no details of previous instances of encounter are ever recalled.

One explanation of Q is reincarnation. In this case Q is sort of an individual "meta-memory" surviving death while M itself is erased by death. A deja vue recognition is thus calling on the meta-memory for something stored in a previous life. However, this view is prisoner to chronological time. It holds that recognition, like recollection, depends on the previous occurrence of the event. But temporal precedence may not be necessary for recognition.

What is the difference between M, memory, and Q, the unknown source? We can link to both. M seems to be an individually stored experience, available only to the one who stored it. On the other hand, Q may be what Jung termed the collective unconscious, a vast storehouse of images supplied by all who ever lived, with access open to all who seriously search. Thus recognition does not require that its experiencer has actually encountered the situation before, but that somebody at some time did, stored it in the collective unconscious, Q, and consequently made it available to others. But this may be too narrow a view of Q, tying it to chronological time. Q may exist in Eliade's "primordial time", it is part of the "universal schema". In a holographic sense every part contains the whole, so recognition is the act of a part "tuning" to the primordial universal schema.
Another way of saying this is that Q exists a priori, and is present ubiquitously, and is not personal and local, but is collective and global. Further, if Q is global it is also likely to be atemporal, outside of time, existing in eternity. If so it is meaningless to ask its origin. The question of origin arises in connection with time and time is a attribute of the

material world.

Another difference between M and Q is that death seems to obliterate M, while Q appears to have an existence independent of the existence of any individuals. Consequently Q is not governed by the death of individuals.

Recollection is about the past, recognition is about the future.
Li Kiang

Is recognition acquired by practice of such disciplines as meditation? Is recognition the result of reincarnation? Is it built into our genes? Is it there ab initio, like some universal clock? Has it to do with cycles or rhythms? Does it arise in iteration (T.S.Eliot) Is it associated with archetypes? Jung found that children and the insane could tune into archetypes, [story of the crazy man who saw the solar wind, before it was discovered]

The appeal of certain stories when they are archetypal, they involve a species of recognition (without any recollection of it ever having happened)

What is the bearer of the cup? The vehicle for the preservation of recognition. Is it the soul?

REGREL1.WP6 SCRAPS March 3, 1995

RELATIONSHIP, RECOGNITION AND BEING

There is an old Persian adage that says there are two kinds of truth: eternal truths that are always there even if never recognized, and those truths which must be supported by constant repetition in order to be true. I believe it is also true that there are similarly two kinds of relationships, and indeed that there are two kinds of existence itself.

I have some relationships that, even though there has been no communication for maybe years, when coming together it is as though we had been talking just yesterday. The closeness and endurance of these relationships are never eroded by time. They indeed exist outside, above, time. A test for any relationship is provided by its ability to persist through temporal absences. Those relationships in our lives that must be sustained by incessant repetitive interactions are ephemeral. And if absence results in erosion then such a relationship does not exist in eternity. It has been said, "Set your love free to go away, and if she does not return it was never meant to be."

But we can go further and discover that a measure of our own portion of eternity can be found in our relationships that endure despite time. These relationships not only contain glimpses of the eternal, but are themselves glimpses of the eternal.

And something similar is involved in recognition. We recognize oftimes even though there is no recollection of previous [in time] encounter or experience. We hear, see or meet something or somebody that we could not have possibly have heard, seen or met before, yet we recognize it or whom. I feel what we can recognize is also a measure of our access to the eternal. That which can be recognized, like certain relationships, exists somewhere outside, above, time.

Our experience with relationship and recognition make clear that we exist both in time and above time. We are both material (existential) and spiritual (eternal). We are both mortal and immortal. Our task here is twofold: to discover who we are and to to sacrilize the world.

RECOG.WPD

Which, if any or all, explain the power of these forms to entertain our projections? Perhaps such forms are mirrors, they reflect some part of ourselves back to us. We **recognize** something in the form that we already know because it is in us. Or perhaps such forms have "frequencies" with which we **resonate**. Both recognition and resonance are aspects of projection. Lastly, we may say that a mystery permits no orthodoxy, and consequently there can be no heresies

–FORMS AND PLACES OF MYSTERY

ECOGNITION: Recognition Physics J.A.Wheeler
Lost Paradigms--Casti p419
Recognition implies non-localism, not only non-localism in spacetime but a more general non-localism. It implies a basic linkage, or even identity, between our thought processes and event occurrence in the universe. Recognition's mechanisms may lie within the spacetime world or beyond it or both. Wheeler asks how do space, time and dimension arise both as concept and as structure of reality. Concept may be the constructor of reality.

–COMAREC.WP6 1995

However, in the historical mode of celebration we have lost touch with the underlying cycles, with the real basis for Kairos--the proper time to celebrate certain aspects of life-- which authenticates history and not the reverse. For example, in celebrating Christmas as an historic event we lose its true power, its power as a cyclic event. Something symbolized by Christmas has a reality beyond the historic and mythic and it occurs in the depths of December not just once but every year. In our age we have embraced Chronos and rejected Kairos. We have substituted remembrance for recognition, and in doing so have chosen mortality over immortality. —EPIPHANY

> What is mind? Is mind local or global? Are there many levels of mind: individual minds related to individual bodies, group minds, a collective conscious and a collective unconscious, a planetary noösphere, a conscious cosmos? Which minds do we have access to? Which die with the body? Is recognition the process of access to a higher mind?
>
> AUGKOANS.WP6 1997

4) The Egret: The Epistemologies of Recognition

These are epistemologies, not designed by us, but given to us. Recognition (not empiricism) is the way of knowing what is Beauty, what is Love, what is Good, what is True. Through them we know without believing, we understand without articulating, we participate harmoniously without direction. This because when we achieve union, one identity, then identity disappears; for ONE has no-existence. 4EPISTEM.WP6 1998

Finally there is *recognition*, the learning of something new that you realize you had known all along. If there is anything that would approach a methodology leading to the ascertainment of *truth* it would be recognition. And recognition is not opinion. Opinion arises from the authority of ego; recognition arises from an invisible ineffable source shared by many. It is the test we each possess for discerning the validity of the claims of all the authorities. But it is not the source of our foible of projecting authority on "authorities". –VERITAS1.WPD 2000

econd, epistemological [methodological] dichotomies:

Empiricism is the epistemology of the outer realm, knowledge conveyed by sensory data and its extensions; Meditation is the epistemology of the inner realm conveying knowledge through intuition and recognition. And both are carried by the creative powers of imagination. Law of the excluded middle logic vs. four fold logics. BELVKNOW.WPD 2001

What is knowing?

Whereas knowledge is a possession of the mind, a configuration of certain molecules in the brain, knowing is a state of the mind, and a special configuration of every molecule in the body. That is to say, knowing is not a matter of thought, it is a matter of feeling. While knowledge may be an accumulation of messages, knowing is an active in-the-present exchange of messages, a duplex communication with some context. Knowing is communion, full knowing is full communion. It is the product of our *intuitive* cognitive functions, sometimes called *recognition.* KNOWKNOW.WPD 2001

There is, besides reason and feeling, our third *epistemology*, the one called recognition. Which can be defined as the awareness of something that we have always known, something planted or wired into our very being, known without having been experienced. Such knowledge, not derived from personal experience is not remembered or recalled but is recognized. We may speculate whether this knowledge comes from previous lives, as many believe, or from access to a collective mind belonging to all humanity, or somehow to our being mentally isomorphic to the cosmos. –METHEUS2.WPD 2001

Also Codices Doc 7

CODE1[COG] CODE2[ORX
2BSORT.ASK
Identitysum Doc 33

An identity crisis is inability to select a category in which to place oneself. A category crisis is that no category exists that fits the thing to be identified. Existing categories do not fit do not work. These crises are related to the two epistemological levels of framework construction and placing items properly in the framework. An identity crisis arises with difficulty in finding the proper place in an existing framework, a category crises arises when the framework itself is defective, no longer supplying proper places for all items. A category crisis may also arise when two categories are split is split in two leading two a new alignment. The crisis arises over whether the old or the new categories are more important. This latter situation is here termed the **cross dialectic.**

RECOGNITION: Recognition Physics J.A.Wheeler
Lost Paradigms--Casti p419

Recognition implies non-localism, not only non-localism in spacetime but a more general non-localism. It implies a basic linkage, or even identity, between our thought processes and event occurrence in the universe. Recognition's mechanisms may lie within the spacetime world or beyond it or both. Wheeler asks how do space, time and dimension arise both as concept and as structure of reality. Concept may be the constructor of reality.

The perennial questions and their derivative questions arise from a partial and limited view of the structures in which we find ourselves imbedded.

However, only a few are concerned with these questions. Only when one reaches a higher level of consciousness, or a level of identification with some encompassing module such as humanity or all living systems, do these questions arise. They are not important to the minds of those struggling for a living, competing on personal, tribal (read corporate), national, racial, religious, species, or any other level. The problem of meaning arises over finding a place and function in the order in which your identity is imbedded. If your identity is with ego, then your meaning is probably to be found in your function and position in your family and tribe. If your identity is with family, then meaning is found in the place and function of your family (and self) in the community and workplace. If your identity is with your corporation, meaning is with the status and vitality of your corporation in the context of the corporate world. If your identity is with your nation, then the status of your homeland in the global order is an essential ingredient to your meaning.

he achievement of oneness is the only possible mode of no-relationship. In all other cases

CASTI PARADIGMS LOST V-C-2
p419

"Einstein showed that the playing field itself is in some way created by the particles [players]

"So rather than having an independent reality of its own, the playing field exists in a kind of symbiosis with the players."

energy size of quanta depend on the frequency of light

$E = h\nu$

J.A. Wheeler: "Recognition Physics"

Willis Harman Roger Sperry Causal Reality
Global Mind Change p. 21 get quote p21

Consciousness is a causal reality

vs reductionism and positivism

I recognition causal or receptive?
or both

recognition ⊃ C reality
⇄

⊃C ⇒ ⇄

an identity is related in one way or another to everything else in the universe from the tiniest insect to the most distant galaxy. But for the enlightened Sage there is no Sage and there is no Other therefore no relationship.
In this class the vehicle is **surrender.** The view of Heaven is the view of Heaven.

Chuang Tzu said, "All creation could not disturb the equilibrium of the sage, hence his repose". Is this because the sage recognizes his identity with all creation?

4) The Egret: The Epistemologies of Recognition
These are epistemologies, not designed by us, but given to us. Recognition (not empiricism) is the way of knowing what is Beauty, what is Love, what is Good, what is True. Through them we know without believing, we understand without articulating, we participate harmoniously without direction. This because when we achieve union, one identity, then identity disappears; for ONE has no-existence.

Before we turn to the broader aspects of the crisis in meaning, let us inquire into what are the sources of meaning for an individual and for mankind as a whole. In fact, What do we mean by meaning? Without going into philosophical depths and details, we may simply say that meaning for an individual, for a society, for mankind as a whole derives from a sense of identity, a sense place, and a sense of belonging. For there to be meaning implies there is a role to be played, a task to be done. For there to be meaning there must exist a relationship between the individual and the other, such as the relationship of need between members of a family. For there to be meaning there must exist a linkage with the environment, or a function in the ecology. In general, meaning implies a connection with context, and a relation to the past and the future.

Within the United States one possible contributing cause to our regression to immaturity is the melting pot. The price of cultural co-existence is superficiality. This trade-off is seen as true from the level of chat at a cocktail party to the level of difficulties encountered at international negotiations. Globally we share only the most basic emotions and values: security, control, esteem, greed, sexuality. Our visions and ideals may be so different from others as to not be mutually communicable nor understandable. Achievement of understanding requires suspension of our cultural prejudices and transcending our

cultural memes. It requires we explore the identity bases of others. But to do this, we must first discover our own identity--and here we face a paradox. The understanding of others begins with understanding of self, and the understanding of self only comes from interactions with what is different from self. A melting pot becomes both a challenge to understand others and an opportunity to understand ourselves. And from these

There are many modular hierarchies with which we identify ourselves and find meaning. Population modules: me, my family, my clan, ...; Place modules: home, neighborhood, region,...; Political modules: party, country, allies, ...; Belief modules: cult, sect, religion,...; Genetic modules: race, species, genus, ...; and many others. There is even an hierarchy among the types of modules, but assignments of the order in that meta-hierarchy vary by individual choice. It has been noted that the extent of spiritual growth of individuals can be measured by the extent of each domain of modules by which they identify themselves. The child starts with me; the sage ends with an all inclusive domain of domains in which all living beings are themselves but a sub module. We become what we include in our domains of identity.

CODICES.MRDOC7

DATE[JUNE 18,2000
SUBJECT[RECOGNITION
PROJECT[EPIONTOLOGY COGNITANS
TEXT[THE FOUNDATION OF KNOWLEDGE IS ARTICULATED RECOGNITION ---L.K.
Understanding is based on what is familiar. Recognition is based on what is inherent. Understanding requires the support of a continent of linkages. Recognition can be an island. Recognition at times takes us into domains that understanding considers inconsistent. Recognition is not the same as intuition. Intuition must be verified. Recognition is the "knowing even as I am known". Knowledge lies in the overlap of the domains of recognition and understanding. Recognition is sometimes labeled "Revelation". But much of what was historically termed 'revelation' has been rendered unrecognizable [pun intended] by overlays of diverse agendas and the distortions inherent in translation. THE FOU
Sir Fred Hoyle noted the loss of meaning in religions. A teaching begins with what might be deep insights and comprehensive injunctions, but the disciples, unless having recognition, gained little understanding. They promulgated what they did understand, but it was soon overlayed with other agendas (usually pursuit of power). After a few generations the teachings became cant and trivialized, continuing only as a vehicle for the overlayed agendas. To perpetuate such a package of inconsistencies, the authoritarian methods of dogma, heresy, and mass manipulation were instituted.

Scripture begins as poetry [allegory], ends as algebra [fundamentalism]

]

Find: Recognition to Recollection

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.

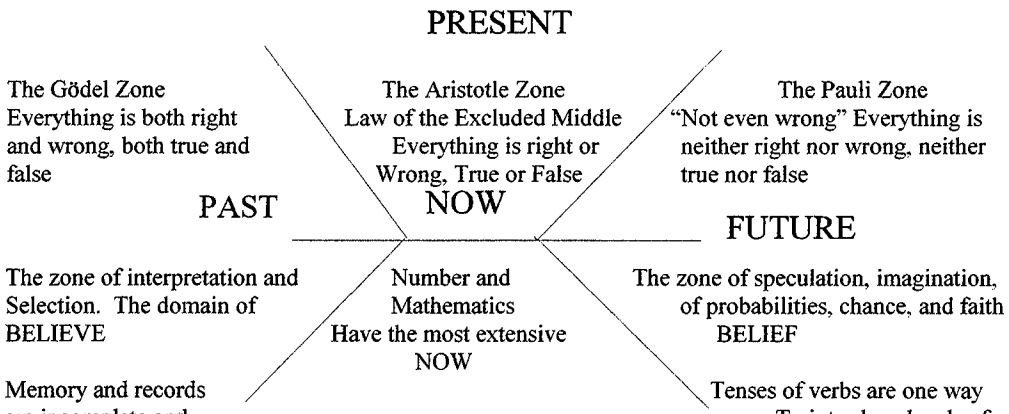
Let us introduce another cat. This cat belongs to the Chinese sage, Li Kiang. Li's cat is one of those who, if inside, wants out; if outside, wants in. And except for the minor periods of transit, at any one time the cat is either inside or outside. No confusion about that. But Li nevertheless sometimes 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.

THREE ZONES OF TIME, LOGIC, AND EXISTENCE



1PERCENT.WPD

THE ONE PERCENT SYNDROME

We have deplored the dangers of dyadic thinking, but now we must face the final step: the adoption of monadic thinking. No choices, no options, no alternatives, not even us/them, Only US. But this form of thinking is not new. Some examples from history:

Umar

Cathars

Bishop de Landa

Vietnam

and now the 21st century's contributions:

The limited mind, overwhelmed by alternatives, even by dyadic choices , true/false, right/wrong, whatever, obliterates choice and creates certainty by decreeing all probabilities ~~to be~~ = 1.
of alternatives to be =0

Some Americans think of the environmental community as a fractious bunch of free thinkers, that if you put two of them together they would generate at least three different opinions. But now two groups - the Pew Charitable Trusts environmental program and the National Environmental Trust - are trying to buck that reputation by combining to form the Pew Environment Group.

1.

PARG, P57 for Eco9

Theaetetus' first definition of knowledge is aisthesis (sensation or perception). The second is onoma, the designation of the objects of perception in naming. The third is logos, the fullness of thought in the formulation of the sentence in which one thing is formally the predication of another. In the most general way, we may anticipate that they look like the great domains of the "rightbrain", the right cerebral cortex, (perception); and then respectively in the left brain, Wernicke's area (naming), and Broca's area (predication or syntax).

Whence?

aisthesis
onoma
logos

Theaetetus – not in dictionary or biography

aisthesis "

onoma " but related to name

IDOLSUP.WPD December 25, 2006

BACON'S IDOLS UPDATED

Francis Bacon (1561-1626), English philosopher and administrator, felt that the methods advanced by Aristotle for acquiring knowledge, and natural law in particular, were too limited. In his treatise, NOVUM ORGANUM, Bacon proposed to replace Aristotle's syllogistic deductive approach with an inductive–empirical approach termed "enumerative induction". But he felt that before induction, or any epistemological methodology, could achieve valid results there were flaws in our ways of thinking that must be acknowledged and corrected. He listed our cognitive flaws, preconceptions and prejudices, under four "Idols", which he labeled: , Idols of the Tribe, (idola tribus); Idols of the Cave, (idola specus); Idols of the Market Place, (idola fori); and Idols of the Theater, (idola theatri).

I. Idols of the Tribe:

These are projections of our own desires, wishes and purposes onto the natural order, including the projection of purpose itself onto the natural order, resulting in our explaining phenomena in terms of some final cause. This idol includes the assumption that our sensory apparatus is adequate for ascertaining the significant facets of the natural order. It also includes our belief in our own importance in the natural order. Recently the so–called "Anthropic Principle", stating that the universe is exactly the way it is in order that we could be here, has become prevalent in current scientific thinking as it has long been prevalent in theological thinking.

II. Idols of the Cave:

These are generalizations from the local, as it is here, it is everywhere. While as above, so below may be true, the opposite is not, as below may not be valid in general whether personal or collective. onto the whole. This idol includes personal prejudices that enter inadvertanly into our thiniking . into our That there exist universals at all is an idol of the cave.
The Cosmological Principle asserts that the universe is everywhere like it is here locally. Local laboratory results are universally valid. While this might simplify the universe, there is no evidence that the laws operating locally are the same as those in the Coma Cluster xx million light years away. On the personal level, out personal experience is blown up to cover what we have not experienced. l level, our personal experience is projected onto a broader

III. Idols of the Market Place:
Semiotics, language, code books
distortions and truncations, one word many meanings One concept many words

IV. Idols of the Theater:
heritages, traditions, customs,

V product replacing process

EPIONTNOTES.WPD June 17, 2006

ON SOME LIMITATIONS

Our knowledge of the universe is beset with limitations on several levels.

Limitations of our senses
vs extensions such as microscopes, telescopes, infrared, x-rays etc.

Limitations of our environment induced habits
particularly restrict connections to continuity and contiguity
trouble with non-local connection, both spatial and temporal

Limitation of our information processing capacities
reduce inputs to a dyadic form
convergence by decisions, uncomfortable with options, need certainty
computers promise to allow us to have more options on the table
simplification to dyadic disputations, search for additional options excluded

Limitations resulting from where we put our identity
Our principal identity is with me and the immediate
Obscuring the essence of the situation in which we are embedded
Sagacity is measured by the awareness of our contexts

Limitations both constrain and enhance. They are both fences and bridges. When you encounter a fence look for a bridge. The bridge may not go where you were planning to go when you were stopped by the fence, but it will likely take you to a better destination than the one you had in mind.

Cf Buddhist presence. "When I walk I know I am walking."
Update to Buddhist driving in modern traffic: "When I am driving I am aware of the surrounding situations, possible intentions of other drivers, and I drive to enhance the safety of all and expedite the flow for all engaged."

PARAPHYSICS
POWER OF
DIRECTION
FENG SHUI
etc

WHAT WE EXCLUDE
LOSE
OMIT

2005 #10

PRAIRIE.WPD April 6, 2005

ON LIMITATIONS [PART I]

WHY IS THERE SOMETHING INSTEAD OF NOTHING?

Imagine being on a boundless open prairie, on an expanse so undifferentiated that everything seems like nothing. There is unlimited choice where to go, but boundless choice offers no destination. Suddenly a path appears. A path? It must come from a source and lead to a destination, but were we to follow it, should we go to the right or to the left? Either way it must lead out of this nowhere to somewhere. Or could it be a loop? And whichever way we went we would sooner or later end up back here. In that case here and now would be both the source and the destination. But would we know this here and now when we got back? Maybe we would really see it for the first time.[1]

On closer inspection the prairie has not one path but many paths. In fact the prairie is crisscrossed with countless paths, each coming from and going to one knows not where. Each path is some epistemological process, each destination is some ontological reality. Yes, countless realities can be reached on this blank prairie depending on which path is selected. This nothingness is the source of all realities. There are countless paths, but finite beings, such as humans, can take but one path. Although confined to one path, to one reality, to one destination, we nonetheless ask, is there not some way we can picture the whole? Some way we could know the nature of all the alternative destinations in order to select the path taking us to our heart's desire?

But a picture of all the alternatives is not available. The point is that being restricted to one path we are empowered and are enabled to create. For example, confined to one path creates a destination for us where none existed before. While the boundless prairie has no destinations, being only a plethora of options and possibilities, it does nothing. But the limitation imposed by a single path empowers us to create and reach a destination, even to reach sequential destinations. And accommodating our natures, this single path gives us a sense of certainty and security. It comforts us with the hope that, if devotedly followed, it will take us to the destination of our dreams.

But on even further inspection, it seems there may be a pattern in these countless crisscrossing paths. It may be that there are really only a limited number of paths and that some of them traverse the prairie in such a manner as to enable exploration of its multi-dimensional fullness and possibilities. Maybe even the path we have selected is such a path. Now we can not only accept that limitations are the way to get to where we could never get without them, but can visualize that limitations ~~per se~~ paradoxically even enable us to transcend the limits they impose.

---

[1]Apologies to T. S. Elliot

In the prairie metaphor, limitations created destinations. But limitations also create other things. Without the limitations set forth in the postulates of mathematics there would be no mathematical truth. Without the limitations in logical reasoning, there would be no true/false. Without legislated limits there would be no legal/illegal. Without the limitations of repetition and reproducibility, there would be no scientific truth. And we may surmise that without the Einstein limitation of $v \leq c$, the Heisenberg limitation of $p \not\times q > \hbar$, and the Schwarzschild limitation of $GM/c^2 \leq R$, there would be no physical existence. [or a quite different physical existence.]

In summary, limitations allow the existence of realities to emerge from unlimited an multi-dimensional Reality. And the limitations we impose on our own creations have given us art, music, and both the aesthetic and ethical. On the other hand, where we reject limitations, as in cases such as political power and weapons, we reverse the enabling power of limits and threaten our very existence.

PRAIRIE2.WPD April 7, 2005

LIMITATIONS II [PART II] order as symmetries ?

Perhaps the most basic diachronic search engaged in by humans is the search for order. Not only a preoccupation of kings and legislative bodies for societal order but of scientists and philosophers for cognitive order. Kings and legislators attempt to create order by formulating laws that define what behavior is acceptable and what behavior is outlawed. Scientists and philosophers attempt to discover laws that can predict which phenomena can occur and which cannot. Both are attempts to reduce human experience to a set of rules. But there are inevitably situations that do not fit the rules; social situations that cannot properly be judged either legal or illegal; and scientific discoveries that do not conform with established theories. These anomalies show us that our search for order is really a search for simplicity; attempts to replace the real world with simplified models we can live with until an accumulation of flaws requires their replacement. The limitation involved here is our information processing capacity.

The developments in quantum mechanics have made clear what we have long known subliminally but have continued to deny: the probabilistic essence implicit in all laws. The true/false absolutism of Aristotlean thinking has abetted our proclivity for simplicity but has obstructed our grasping the essence of the natural order. Laws can no longer insulate us from probabilities. The improbable, however rare, may prove to be more important in the world than the highly probable. To find replacements for our flawed models, the perplexing attributes of randomness must now be confronted face on. The formulation of each law must include its probabilistic penumbra. We are witnessing our cherished ideals of order, truth, and certainty passing into history to join such former ideals as Parmenides' "As it was in the past, it is now and ever shall be", and Protagoras' "Man is the measure of all things".

In LIMITATIONS I the empowerment of limitations was noted. Can it be that self-contained and self-imposed limitations as well as contextual limitations liberate us?

We impose on the world the limitations contained in our concept of order. But the imposed limitations in turn enable us to perceive , continue our search for higher order.

When does a limitation inhibit, when does it enable?

Open Prairie thinking is most difficult. It requires the construction of an infrastructure that is different from any that preceded it.

Our infrastructure is a primary limitation, but an indispensable tool.

No attachment to fulfillment, only to process [for VECTOR II]

ON LIMITS
cf 2005#10
Also Prairie ---

COGMIL.WPD May 8, 2005

COGNITIVE MILIEUS

Meandering thoughts on May 8, 2005 DRAFT

All that is created, whether by the natural order or by humans, appears to be governed by certain fixed rules or bounds. There may be trade-offs, in which a bound is extended but results in another bound becoming more restrictive. We might differentiate a rule from a bound in that rules are fixed while bounds may be governed by a trade-off rule.
What is fixed and by whom, what is bounded, what is free.
This may be expressed in the number of degrees of freedom involved.
Is the proverbial box that we try to think outside of fixed, open
This is all about the nature of LIMITS
Some limits appear to us as absolute, such as the laws of nature
Some are due to our own natures. Some we self impose [because limits can enhance as well as restrict] or enhancement x restriction is a meta trade-off property of all limits.
What are some of the species of limits that we self impose?
What do we impose as fixed and what as alterable? what as absolute and what as arbitrary?
Where in all of this does the notion of freedom lie?
Of course, all change. But what are the ones with the longest shelf life?
FIXED RULES
In this category we find mathematics. Arithmetic, geometry, algebra, and other branches of mathematics all operate with fixed sets of rules. But the rules in mathematics may be divided into three levels: 1) The level of definitions; 2) The level of axioms; and 3) the level of postulates or special initial and boundary conditions. For example, the geometry of Euclid defines parallel lines as lines that never intersect.
FIXED INTENTS
The laws that are passed by kings or congresses are constructed with an intent, such as to preserve order or power.
FIXED PARADIGMS
The history of science illustrates that over certain periods of time fixed concepts govern what is allowed and not allowed in the formulation of hypotheses.[1]
FIXED PRINCIPLES
These are perhaps the most basic fixed features that exist. Many are called natural laws, others are called substantive values.
FIXED PROCESSESThe examples here are such procedures as the scientific method, or rules of the senate,

FIXED ⇒ LIMITATION

[1] As pointed out by T. S. Kuhn in his "Structure of Scientific Revolutions"

If ∄ limits ∄ life span
no shelf life

but existence is repetitive ⇒ cycles

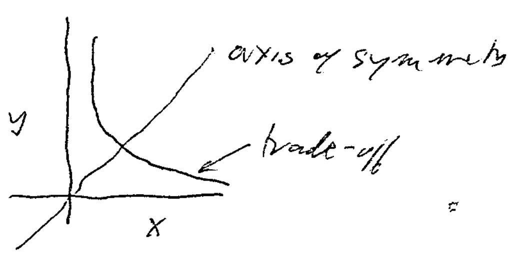
A loop may suffice for existence
but lifetime requires repetition of the loop
i.e. a second or modulated cycle

closure for existence
to
openness for change

⇒ change requires death
some cycle must be broken

Emmy Nöther Conservation ⟷ Symmetry

A trade-off is a species of conservation
∴ a form of symmetry



$xy = k$ = hyperbola k ~ what is conserved
$x = y$ = axis of symmetry

$\exists \{h's\} = \hbar (\alpha\mu s)^n$ Fulcrum?

e.g. $M_U \cdot R_U \cdot c = \hbar_U$

$\hbar_U = \hbar_P (\alpha\mu s)^3$ $\frac{M}{R} = \frac{c^3}{G}$ axis of symmetry

$= 94.471939$

$M \cdot R = \frac{\hbar}{c}$ conserved

$\frac{M_U}{R_U} = \frac{c^3}{G}$

$\frac{M_U R_U}{\hbar / c} = (\alpha\mu s)^3$

In art it seems that the fewer the bounds the shorter the shelf life.
Or at least those most radical "pieces of art" such as mountain to the sea fences and paint splashed on the canvas from 20 feet have the shortest life span.

The Japanese kimono with its fixed form allows wide choice of pattern, and has been around for centuries.

What are fads, those fashions of brief shelf life, are they exploratory? In the hope we shall discover something we want to make some rules about.

Again having rules and bounds seems to support survival.

Is there a profound trade-off between freedom and shelf life?
Dogmas do endure.
Yet there is also self destruction in the imposition of some limits such as homogenization

What species of limit is homogenization? Certain limits assure survival, others terminate.

One of the greatest bits of political wisdom of all time was the idea of separation of powers. It just didn't go far enough.

It appears what this is all about is an exploration into the nature of limits
Euclid, Riemann, Gauss, Lobachevsky, have shown varying a particular initial condition, results in a different geometry, What specific things that we view as absolute and fixed can we find alternatives for and change? Is this too scary to contemplate? Is this why we avoid doing it?

If the values of the fundamental constants were slightly changed, there would have been a different cosmos and we wouldn't be here. Some limits, or their values, seem to be ontologically critical.

So. Dear Fritz, help us with the morphology of limits.

What is the relation between order and symmetry?

symmetry as transformation eg. translation, rotation ... } Shared con
↓
movement, change

Forces as Limits

Pain, Pleasure as Limits

Problem Formulation

1) Selection of Level

A tool ~ limit, it both enables and delimits

e.g. a paintbrush

A decision, selection affects limits

it precluded what was not selected c.f. Action/Option

but allows, energizes the present path

Limits ~ guides "do not go there" stay on the path

But no path is TRUTH, only a selection

June 1, 2005

Limits re the Search

Quest: limit of pre-selection of destination

Search: exploration limited by selection of search domain

e.g. Sciences the repeatable ∴ predictably reproducibly

now → highly probably

soon → related type of probability

e.g. Math selected axioms —

RULES AND BOUNDARIES

When we cross a political boundary we notice that things change. Quickly visible changes may include flags and uniforms. There may also be other more significant changes such as language and customs. But inevitably and most significant of all, there will be changes in the laws or rules. Indeed, the fundamental attribute of a boundary of any sort is when it is crossed the rules change. When we cross the boundary from childhood to adulthood, we are subject to different laws. When we marry, the rules change. When we enter a school, a church, or national park, the rules change. Leave your house and the rules change. At sea, the rules change. In the air, the rules change. At mach 1, the rules change; at different temperatures, the rules change. We may define a boundary as a place where, perhaps not all, but at least some of the rules change.

Rules may change slowly over time or distance, creating a diffused boundary or verge in which the rules are not hard and fast, but change gradually. History confirms that the rules of different cultures change both with time and at the verge of their interaction with one another. Thus boundaries need not be sharp.[1]

To assume no change in rules is equivalent to holding that no boundary exists.

Border vs boundary

do rules define or create a boundary? Rules do create bounds and limits

Gödel showed that rules are self-limiting

Germs do not recognize political borders

A border is where **some** rules change

determinism and necessity domains where there are no alternatives allowed

Define:

border, boundary, bounds, verge, rules

a border is where there is a sharp change in controlled rules

a boundary is where there is a sharp change in uncontrolled rules, the rules change themselves

e.g. Mach 1

British, German, Russian, French joke

In Britain, everything is allowed except what is forbidden.
In Germany, everything is forbidden except what is allowed.
In Russia, everything is forbidden including what is allowed.
In France, everything is allowed including what is forbidden.

---

[1] A possible answer to North American immigration problems is to create a verge to replace sharp borders. Eastern custom prefers a verge or diffuse boundary to a sharp boundary. For example, the desirability of there being transition spaces between exteriors and interiors. [cf. Lin Yutang]

COG

90DISCRIMS.WPD March 1, 2008

DISCRIMINATIONS AND DISCRIMINATORS

INFRASTRUCTURES | PATTERNS

MODELS | THEORIES

GENERALIZATIONS | ABSTRACTIONS

INVARIANTS | ABSOLUTES universals

ACCURACY | PRECISION

ELEMENTS | SETS

TOP DOWN | BOTTOM UP theology | science

TRUTH | VALIDITY

CO–ABERATION | VERIFICATION

CORRELATION | CAUSATION

CONTINUOUS | DISCRETE

CONTIGUOUS | NON CONTIGUOUS

MESSENGER | MESSAGE carrier

SIGNAL | NOISE

DATA | INFORMATION

P-SPACE | H-SPACE movement | form

PROPOSITIONS | COMMENTARY Aristotle | Acquinas

EXTENSIONS | REPLACEMENTS

PROBLEMS | ISSUES

PROJECTS | GAMES

DISCRIMINATORS:

GAPS

PRECISION

ORTHOGONALITY

CERTAINTY COG

ORTHOG1.WPD June 19, 2007 [JUNETEENTH]

Ortho has the primary meaning "direct",
but in mathematics orthogonal means perpendicular,
and therefore redirecting to a new dimension, having
with a measure of independence from precedence.

We build on what exists. Our processes create convergent sequences. And we impose limits such as consistency, continuity, and contiguity that effectively exclude alternatives. We label our process as the search for truth, but our unconscious motive is the quest for certainty. Truth is too overwhelming, too varied, too contradictory and paradoxical for our comfort, therefore we substitute certainty and call it truth. And out of the converging quest for certainty springs the parallel quest for control and power which inevitably supercedes and nullifies certainty. This was long ago described in myth:

Apollo [Order and Certainty] vs. Dionysus [Randomness and Openness]

and in history:

Plato [Questions and Mystery] vs. Protagoras [Answers and Eristics]

and today:

Orthogonality [Alternatives and Mutuality] vs. Party Lines [Competition and Winning]

We are prisoners of our words and their traditional assigned meanings. We need either to re-define many of the terms we use to represent concepts or to create neologisms.
Here are some terms that need to be re-examined, generalized and/or discriminated:

whole	What characterizes a whole? How many species of whole are there?
part	What characterizes a part? How many species of part are there?
one	What characterizes one? How many species of one are there?
order	What characterizes order? How many species of order are there?
monad	What characterizes a monad? How many species of monad are there?
limit	What characterizes a limit? How many species of limit are there?
abstraction	What characterizes abstraction? How many abstractions are there?
generalization	What characterizes generalization? How many generalizations are there?
discrimination	What characterizes discrimination? How many discriminations are there?
Search	
Quest	
Paradox	
Information	
Energy	
Dimension	
Dimensionality	
Level	

Some words may stand for many things
∴ discrimination

Some things have many words
∴ translation & standardization

RANDOM
EXIStence
No Thing

SYNTHESIS

KRASNIK08.WPD May 23, 2008

74th ANNIVERSARY OF MAY 23, 1934

For several years I have written an essay on this date reflecting a spiritual experience I had on May 23, 1934. As I subsequently learned, it was an experience that changed the direction of my life. While genetic and memetic influences have played the largest role in my life, as they do for almost everyone, there was still this unvarying compass from May 23, 1934. In recent years guided by this compass I have been distanced from the culture in which I have been living for nigh ninety years. And the view of the culture from the distance is disturbing.

I do not have answers nor solutions to the problems engulfing human society, only the injunction: Look at everything in a different way, indeed, in as many different ways as possible. This injunction has been proposed and iterated by many in the 20th Century.

"We shall require an entirely new way of thinking if we are to survive" –Einstein
"To save the world might take greater freedom of thought than we are capable of." –Zwicky
"Relations, not entities, are basic" –Levi-Straus, Michel Foucault, and other structuralists
"Imagination is more important than knowledge" –Einstein, again

In brief, eschew the party-line in your thinking, whether it is a religious, scientific, medical, political or other tradition.

The basis of this injunction is that what is culturally considered to be *reality* is but a narrow selection from the immensity of Ontic Possibility. This selection is an inheritance from pre-historic times based on what worked for early homo sapiens. But it is no longer working! Other life forms, birds, fish,..., have made different epistemic selections and have tuned in on and utilized energies and forces that have eluded our party-line sciences. Much more is out there than our reality box can grasp.

How can we follow the injunction? Some possibilities:

- Leave rare, improbable, unaccountable experiences on the table of possibility.
- Do not dismiss that which "doesn't make sense"
- Reject certitude as a goal.
- Consider what is continuous and contiguous as only special cases.
- Be open to the existence of broad interconnectedness.
- Absorb the euphoric embrace of the mutuality of compassion.
- Go into the Wilderness, Sit under the Bodhi Tree.

SYNTHESIS

POST90.WPD July 29, 2008

WHAT I HAVE LEARNED SINCE I BECAME NINETY

Conversations tend to take one of two forms:

Contests in self-advertizing and contests in self-assertion.[1]

As a consequence conversations drift to details or specifics that exclude all but one or two present or sometimes exclude all but the speaker. (In this case the subject matter ~~of the drift to details is usually me and mine~~[2].) Males tend to take the conversation to the detailed parts of a carburetor; females to "Oh that awful hair–do, and how could she wear that blouse with those shoes?" But, after a certain age, both sexes prefer to go to the details of pills, ailments, medications, and side effects.

Self–advertizing and self–assertion are manifestations of everyone's need for respect. And no matter how self–sufficient we are, we search for approval, usually the approval of peers. In recognizing this universal need in others we have an opportunity to find the answer to the same need in ourselves. We respect ourselves in respecting others.

One of the most fundamental ways to communicate respect to another is to listen attentively to what they have to say. In talking people express their needs to us, and in listening we send our respect and compassion to them. This becomes an instance where giving takes the form of receiving. *So sometimes it is more blessed to receive that to give.*

Returning to the matter of approval of peers. One of the important duties of any head of state or holder of high office is to give respect to their underlings. The queen bestows knighthood, the president gives medals in the oval office. In this exchange we and they become peers. We respect our kings and presidents because without our respect their medals and ~~knighthood~~ awards become meaningless.

Here the story of John Smith and Powhatan comes to mind. When the English landed in Virginia the Indians offered them corn, land, and friendship. But this was temporarily ~~ignored~~ refused.. Then the colonists seized land and crops. Powhatan asked Smith, " Why did you not receive our gifts when they were freely offered, but then came and seized them by force?" Smith replied, "If we had received your gift, it would have made us equals."

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[1] In the case of a formal conversation on a preassigned topic (as in Congress or Parliament), the self-advertizing takes the form of oratory, and the self-assertion, eristics.

[2] But as Paul Feyerabend noted, one can get deep insights even when having to listen to ~~all such~~ repetitive trivia

SYNTHES.WPD August 1, 2008

There exists an idealistic type of conversation called a synthetic conversation. (There may be about 0.00038 % of the general population capable of participating in one.)

A synthetic conversation may be **quest** oriented, that is, have a specific problem to address or might be **search** oriented, put the cards on the table and see what develops.

With all the dots on the table, study how we can organize them, trying not to exclude any dot. Once having developed an organization for the aggregate of dots, the next step is to fragment it, and start over. Then repeat the process, repeat, repeat, ...until **repetition** begins to transform into **iteration** and the dots themselves take over. We then get to watch dots self-organize. That is real synthesis !!

Some useful tools for synthesis are:

Zwicky's Morphological analysis
Systems theory, GST
Abstraction-Generalization
Contextualization [expanding out of being a special case] or "looking beyond the stars"

footnote:
Herman Kahn's algorithm for getting a synthesis unstuck:
"OK We agree with all that you have said, now let's skip it and go on from there"

Hegel wrote several hundred pages about what he called dialectics, about contraries, theses vs. antitheses and their syntheses. But he never made clear what the process of synthesis was. This vacuum was filled by Marx with the concept of struggle, synthesis was to be effected through struggle. Lenin picked this up and the dialectic became a class struggle for the world: Dialectical Materialism. A bad special case of dialectics, of synthesis, and of materialism.that turned the globe over to something just as bad: Capitalism.

COGAPH.WPD August 18, 2008

EINSTEIN
QUOTE[WE SHALL REQUIRE A SUBSTANTIALLY NEW MANNER OF THINKING IF MANKIND IS TO SURVIVE.

EINSTEIN
QUOTE[The psychical entities which seem to serve as elements of thought are certain singals and more or less clear images which can be "voluntarily" reproduced and combined... This combinatory play seems to be the essential feature of productive thought - before there is any connection with logical construction in words or other kinds of signs which can be communicated to others... The above-mentioned elements are, in my case, of visual and some of musical type. Conventional words... here to be sought for laboriously only in a secondary stage, when the mentioned associative play is sufficiently established and can be reproduced at will.

BACON. FRANCIS
QUOTE[The Universe is not to be narrowed down to the limits of the understanding, which has been man's practice up to now. The understanding must be stretched and enlarged to take in the image of the Universe as it is discovered.

EDDINGTON
QUOTE[We need scarcely add that the contemplation in natural science of a wider domain than the actual, leads to a far better understanding of the actual.

L.L. WHYTE
QUOTE[The awkward fact is that reason is never aware of its hidden assumptions.

RALPH GERARD
QUOTE[A real breakthrough is when somebody has sufficient creative imagination -- and courage to follow it up, which may be even more important, -- to say: "Let us look at the universe in terms of some new kinds of entities, some new kinds of units, or some new way of combining units."

WILLEM DeSITTER
QUOTE[A special feature of the development of physics in the nineteenh century has been the arising of general principles beside the special laws, such as the priciples of conservation of mass and of energy, the principle of least action and the like. These differ from the special laws, not only by being more general, but they aspire, so to say, to a higher status than the laws. Their claim is that they express fundamental facts of nature, general rules, to which all special laws have to conform. And they accordingly exclude a priori all attempts at "explanation" by hypotheses or mechanical models. It is characteristic of the theory of relativity that it enables us to include all these principles of conservation in one single equation. [1932]

COG

CUSA.WPD

April 7, 2005

COGNITIVE ANARCHISTS

NICHOLAS OF CUSA

Nicholas of Cusa (1401-1461), a remarkable diachronic thinker. A century before Copernicus he claimed that the earth itself moved and that it was not at the center. Going beyond Copernicus he reflected modern cosmological thought when he said, "The fabric of the world has its center everywhere and its circumference nowhere." Relativity enunciated in the 15th century! In his treatise, Learned Ignorance, (1440) he said that the universe is neither infinite nor finite because there are no limits with which it is enclosed, that is, the universe is finite but unbounded. His cosmology not only foreshadowed relativity, his logic anticipated Gödel's Incompleteness Theorem, when he asserted that "reason is inadequate for determining truth". His logic was perhaps the earliest non-Aristotelean logic in the West. "It both is and is-not, but it is also neither is nor is-not."

KURT GÖDEL

Kurt Gödel, greatest logician of the 20th century, famous for his Incompleteness Theorems, in which he proved the intrinsic limitations of axiomatic systems, felt that stories were the best devices for grasping truth. He stated, "Only fables present the world as it should be and as if it had meaning." A World Without Time, Palle Yourgrav, p5 He saw stories as going beyond logic and equations in conveying *contexts* which are required as well as *contents* for communicating meaning. He implies that meaning is primarily about humans not reality.

PAUL FEYERABEND

The scientific philosopher, Paul Feyerabend, a 20th century thinker in the forefront of interpretations of modern physics, agreed with Gödel. He asserted that "A systematic analysis is a fraud. So why not avoid the fraud by going directly to stories." Killing Time, Paul Feyerabend, p163

MEMO2.HTW DISK: EMERGENCE October 2, 1989

TOWARD AN INFRASTURCTURE FOR NEWTHINK

The notion of NEWTHINK must be put into juxtaposition with:

- NEW PARADIGMS and NEW CONCEPTS
- A NEW ONTOLOGY
- NEW EPISTEMOLOGIES
- GENERAL SYSTEMS THEORY
- HOLISTIC THINKING

NEWTHINK is none of these and in some sense all of these. The discriminations are important.

First, new ideas and paradigms alter our thoughts and the direction our thoughts take but do they constitute a new way of thinking? To get a handle on this question, let me list some items I consider to be new ideas and in another column items I consider to be new (or alternate) ways of thinking. (New here refers to ideas not yet in the main stream of thinking beyond their specialized fields.):

NEW CONCEPTS

- Cybernetics
- Brown's 'Laws of Form'
- Fractals
- Abstract spaces
  - Banach space
  - Hausdorf spaces
  - Hilbert space
  - Hamming space
- Holograms
- Reality by consensus
- Chaos theory
- Parallel Universes
- States of Consciousness
- Non-Zero Sum Game
- Platooning Traffic
- Forms of Self-Reference
- Synchronicity

NEW MODES OF THINKING

- Totalism: All possible solutions
- Facetism: Difference in aspect
  - Perspectivism, von Bertalanffy
  - Multivalency, Jencks
- Trans-rational thinking
- Meta-consistency
- Vertical logic
- Solution vs. Confrontation
- Cooperation vs. Competition
- Contextualism *
- Subjectivism
- Anticipation, Platt
- Parallelism and Pluralism *
- Post Objectivity
- Multi-level thinking

* Items that are currently in the main stream. Contextualism is an integral part of holism while pluralism, a vintage idea, is finding new dimensions.

After all the side-effect impact...
Engineers have not learned to think holistically
they are Yang thinkers, focus on a problem
What is Yin engineering.
architecture

The module of planning.

Significations is the real source of power in the information age

Commissions must take Enterprise
Party should say what not how much, or how
The party should significate.

Lewis Babcock Ryon
11/15/1893
08/27/1972

Mae E. Ryon
05/20/1894
10/27/1980
10/12/89

Engineering
Ryon

Back in the 30's when engineering curricula was still centered on steam power, ~~electr~~ rotating electrical machinery, railroad curves and ~~earthwork~~ trusses. Corliss engines
Our professor of civil engineering one day asked the class a non-engineering type the technical question: "What is an engineer?"
After going around
All the newlearned, technical knowledgeability was at a loss.
Finally he gave his answer: "An engineer is a person who can solve the problem at hand with the ~~too~~ means ~~tools~~ at hand."

These means included know-how at hand.

The "at hand" part refers to a localization then, but no longer the norm. Today → a more global availability of know-how + means. (except where proprietary interest and competition prevail)

But scientists tell us ∄ a solution to our problems within the constraints we labor under.
What are these constraints.
Constraints of know how?
Rules of the game? Feynman
The competition paradox worth Japan
Modularity i.e. levels solves many paradoxes
→ New think

What is the proper module of competition?

Totalism: This notion was proposed by Zwicky in his Morphological Thinking. The idea is not to find a soloution, but to search for the totality of solutions. He became interested in proofs of the Pythagorean Theorem and collected numerous novel and classical cases. J.D. Barrow picks up on this idea in his "World Within the World" p.279.

Facetism: From the total set of alternative views synthesize a meta-view which contains each member of the set and consistently represents each member as a facet or aspect of some greater whole.

Trans-Rational Thinking: This is thinking supplemented by meditative or other trans-cognitive paths. Supplementing the intellectual way of knowing with alternate state ways of knowing. Example of the Stanford researcher into the nature of meditation, who approached the problem scientifically, then finally decided to learn to meditate and gained a whole new perspective on the problem.

Meta-Consistency: Helpful in explaining this process, is the metaphor of knowledge as a mega-molecule. Classical consistency has to do with what local structures are possible, (e.g. hexagonal or triangular linkages) while it may be possible globally to join parts of the molecule back on itself in ways that complete a connected structure but have nothing to do with the set of allowable local linkages.

Vertical Logic: This is taken from Brown's logic of 'naming'. Vertical logic is the logic of representation and follows laws different from classical Aristotelean or 'horizontal' logic.

10/25/89

The Morphology

Thus Palace: Fixed or Expanding

Path: reversible with choice to return to branch point

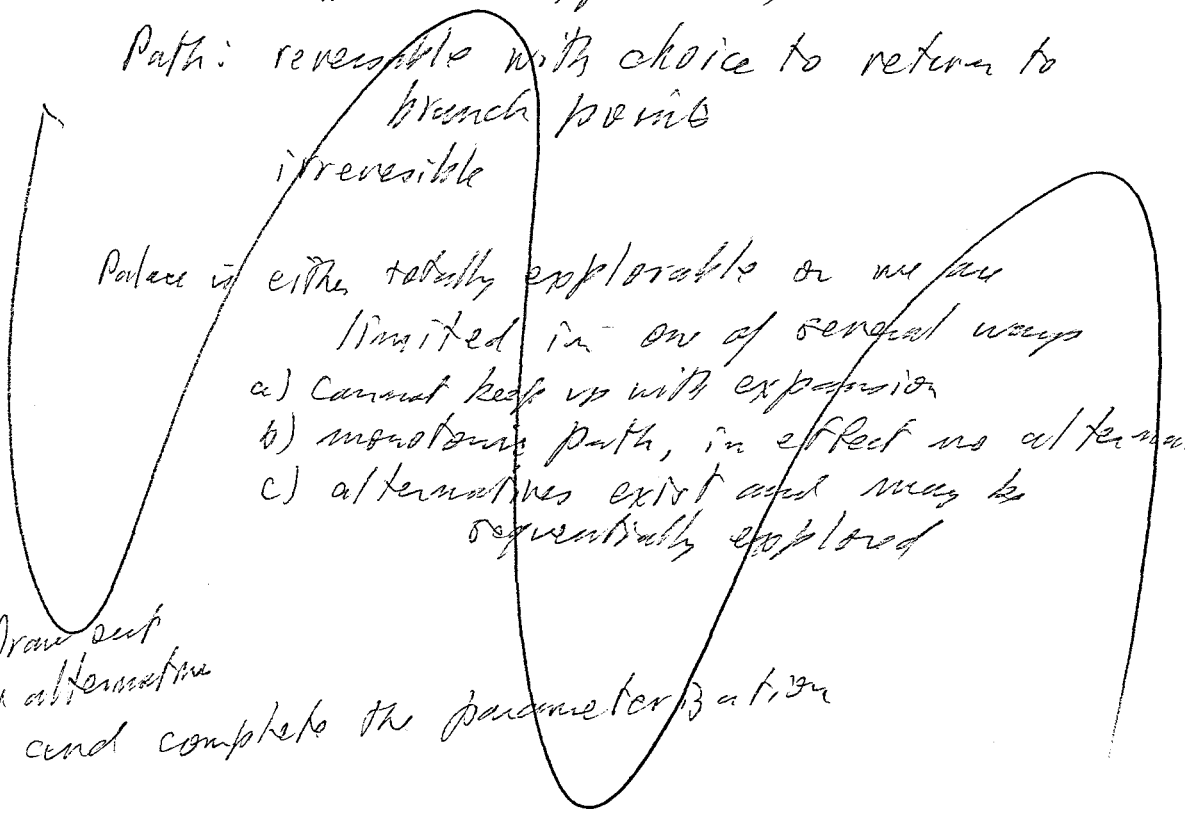
irreversible

Palace is either totally explorable or we are limited in one of several ways

a) Cannot keep up with expansion

b) monotonic path, in effect no alternatives

c) alternatives exist and may be sequentially explored



Draw out the alternatives and complete the parameterization

COS

PERFINT.WP6 APRIL 10, 1998

PERCEPTION-FACT-INTERPRETATION

Fact is the name we give to that which bridges perception and interpretation. A perception is an input, an interpretation is an output, so a fact is a construct that exists only in our heads.

There are protocols governing the establishment of facts. These protocols differ among various professions, being set by consensus within each group. The courts set their rules of evidence on the basis of information that is available; the scientific community defines what is acceptable as scientific fact on the basis of testability and falsification; religious bodies proclaim what they hold as fact on the basis of recognition; and the rest of us have our personal criteria regarding what we will take as fact and what we won't.

In general facts are established in two ways:

For a single event to be a candidate for being factual, its description must be the result of **consensus** of perception among all witnessing the event. No consensus, then doubtful factual status. For example, the event of an appearance of the Virgin first witnessed by three children at Fatima in Portugal in 1917, and later witnessed by hundreds acquired doubtful factual status because not all present perceived the Virgin.

In the case of a single observer, such as a researcher in the laboratory, for an event to be candidate for factual it must be a repeating event, or as scientists put it, results must be reproducible. A single observer witnessing a single event can never claim factuality. For example, the Russian astronomer Kozyrev observed a flash in a certain crater on the moon, perhaps an impact, but there being no other observers the event was discredited. However, factuality was partially restored when the record of a similar event observed by five British monks in the summer of the year 1178 turned up in the journals of Gervase of Canterbury.

Coordinating the foregoing requirements, we see that to be considered for factuality, the number of observations or perceptions must be greater than one, regardless of how they are distributed between events and observers. In addition, in the case of a single event there must be consensus among the observers. Put explicitly:
A fact does not exist unless,

THE NUMBER OF OBSERVERS x NUMBER OF EVENTS > 1

ERGODICS

A single observer perceiving a single event cannot establish it as fact. Multiple observers can establish a single event as fact provided there is consensus, and a single observer experiencing multiple repeatable events (head aches for example)can claim them as fact. But science is more restrictive. It says a fact does not exist unless,

THE NUMBER OF OBSERVERS >> 1 **AND** THE NUMBER OF EVENTS >> 1

Thus science refuses to grant a single event status as scientific fact regardless of the number of witnesses. Thus the Big Bang, being a single event, cannot be scientific fact, and some maintain that modern cosmology is not even science. These requirements for factuality lead us back to Pythagoras' insight: "Existence of a thing requires that there be at least two of them. One of anything cannot and does not exist!" (This could put monotheists in trouble).

FRAMING AND SUBSUMING ISSUES

Politicians, lawyers, and spin doctors, frame issues for public consumption. These professions are trained to look at the world in controversial terms and to formulate its complexity as black and white issues suitable for advocacy positions. It is the task of historians, philosophers, and those technically trained to remove those frames and subsume the issues in the full picture from which they were extracted. But this is not a simple task. The construction of a full picture is difficult, requiring the identification of normally overlooked contexts and parameters. One motivation to frame on an adversarial level is that it is far simpler than to look for deeper ingredients. .

It is not that we are unable to do better in framing issues and finding resolutions. It is that we really don't want to. We are a) lazy, it is hard work to penetrate the levels of abstraction and the psychological contexts at which resolutions emerge. We are b) immature, insisting on speedy and definitive answers to all problems, unwilling to live with ambiguities and inconsistencies until our understanding and comprehension increases. We are c) arrogant, we do not wish to admit to a huge investment in what isn't working. We prefer to hold that more of what hasn't worked in the past will work in the future if only we have more **resolve**. We are d) superstitious, fearful of questioning any of our sacred cows. They may turn into bulls and gore us. Finally, it must be admitted that as a species we need challenges. This in itself is not a flaw, but actually an asset. Flaws arise when we substitute superficial challenges for basic challenges. We find it easy to challenge each other, those across from us in the soccer stadium, those in the church down the street, those whose skin shade is different, those who live across some political border. But we prefer to ignore our common challenges: what our activities are doing to our planet, what our values are doing to our social order, how our ways of organizing are contributing to self-destruction, and how our traditions are closing the doors that lead to grasping reality.

> The year 1913 was the last year in which we could hold that the flaw was in the system and not in humanity,
> –Barbara Tuchman

APPROACHES TO SUBSUMING AND REFRAMING

Limited information processing capacities and the reduction to us/them
- Destruction of options
- Hsun Tzu: Human obsession with one aspect or agenda
- Elephant and blind men
- Excluding the law of the excluded middle

Confusing sets with subsets

What is permitted and not permitted on the table
- What is not perceived, what is denied, what is ignored
- Dogma, Rules, and vehemence
- Selective skepticism

Meta criteria
- Consensus, Majority rule , Authority, Precedent, Empiricism
- Compromise and Mediation
- Determinism (all past events) — Proshloye nye Proshlo (The past is not past)
- Fibonaccian (last two evnts) — "
- Markovian (last event) — "
- Existentialism — Proshloye Proshlo (The past is past)
- Karma vs Forgiveness,

Straw men and spin
"Nothing but ...."
Facts and interpretations
- Belief and perception

Contexts
Domains of Necessity, Choice and the verges.
Cause vs consequence
Side effects: Everything is connected, Yanghui triangle

Ozbekian's Law: overruling all other criteria
- If we can do something, we will do it

CURRENT ISSUES

1) GOD AND THE CONSTITUTION
   Intent vs Interpretation vs Changing Desiderata

2) EVOLUTION AND INTELLIGENT DESIGN
   Levels of randomness
   Constructing an elephant

3) MAJORITIES AND MINORITIES
   Melting Pots
   Parts and wholes, module size

4) FREEDOM AND REGULATION
   Rights and responsibilities
   Source of regulation

5) INTERNET ISSUES
   Profit, privacy, political control

6) CLONING ISSUES
   Theological, medical, Ozbekian

7) EDUCATIONAL ISSUES
   Alternatives, tax support, control

WHAT IS A WORLDVIEW?

A worldview is a set of core-beliefs concerning the basic nature of man and the universe.

This definition may sound like the preserve of ivory tower philosophers, but the fact is that every one of us carries around with us a worldview as part of our mental heritage. Although we are rarely conscious of our worldview and most of us could not begin to make it articulate, nonetheless it infuses in direct and subtle ways how we perceive the world and how we judge all of our experiences. It supplies the framework that plays a major role in molding our attitudes, bending our decisions and shaping our behavior.

The key word in the definition is belief. While beliefs may be suggested to us by facts and while they try to be consistent with facts, they are--unlike facts--neither verifiable nor demonstrable. They are assumed. In fact, core-beliefs play a role in worldviews similar to the role played by axioms and postulates in geometry. But beliefs are more than just what we assume to be true; they also involve what we consciously or unconsciously hope will become true. It is in this sense that beliefs energize us and create their own imperatives. In demanding our dedication they work in us for their realization. Even the postulates of Euclidian geometry possess a sort of imperative. Over the centuries as these basic postulates and axioms were continually affirmed, they increasingly appeared to be absolutes. Only with the greatest of difficulty was this mindset overcome and alternatives generated that disrobed them of their aura of absoluteness and restored them to the level of assumptions. Similarly, a worldview becomes increasingly natural and unquestioned as it designates for us what is significant in our experience and thus directs our selection of values, our formulation of attitudes and our patterns of behavior. In time our worldview with its set of core-beliefs becomes like the light and air in a room. It is so pervading and omnipresent that it sinks from consciousness until recalled for us by some sudden change--an encounter with unlikeness.

Philip Rieff in the Triumph of the Therapeutic proposes that a culture survives because it has the power "to bind and loose men in the conduct of their

1° Belief as opinion
is When the possibility of verification exists
2° Belief as assumption - as in WV
3° Belief as hope or faith
Ought - affecting Reality

affairs with beliefs which sink so deep into the self that they become commonly and implicitly understood." But such a set of beliefs, a set that will provide a culture with a positive on-going dynamic that makes movement into the future possible, may not be arbitrarily synthesized. Such a set must resonate with the deeper wisdom of the race, which is rooted in man's biological nature, his sensory structure and the integrated totality of his cultural experience. The general invisibility of our worldviews does not render them less vital for our cultural health.

While energizing us, a worldview also significates for us. (A worldview is thus vector-like, possessing both a magnitude and a direction.) A worldview emphasizes those cultural experiences that came to us early in our history and sets its compass by them, making reorientation difficult. The fixation may in time become so strong that many areas of experience may not only be ignored, but even denied (e.g., until recently this was the situation with ESP phenomena in our culture). Thus we not only build new experience epitactically on past experience, but build it in a highly selective manner in the direction significated by our worldview. In the case of knowledge this has the effect that what we know is not so much determined by what is, as it is dictated by what we already know. The imperative of ~~energy~~ an information structure is primarily to seek its own replication in all that it encounters.

While our basic cultural worldview is largely invisible to us, frequently parts of it are brought into awareness through an encounter with differences, such as between Eastern and Western approaches, or through an encounter with a value shift, such as the recent introduction of ecological values. Change in illumination or temperature makes us aware of the air and light in the room. B.F. Skinner writes Beyond Freedom and Dignity and brings to consciousness differences between the behaviorist's view of man and that more traditionally held by most Americans. Core-beliefs are revealed by exposure to those that differ. We travel to the People's Republic of China and encounter different views of freedom, responsibility and even the definition of the good life. We are then able to see for the first time some of our own cultural assumptions. Thus through either change or exchange the tenets of worldviews become visible to us.

Worldviews, though largely invisible, nonetheless play important roles in our choice of policies, the kinds of educational systems we design, our approach to the distribution of material goods, our priorities with respect to human needs, and so on. Our fundamental assumptions about the nature of man, for example, shape not only our ethics, but our institutions, practices, and structures:

> "If man sees himself as separate from or superior to nature, then an exploitation ethic can be fostered more easily.
>
> If man sees himself as a part of or one with nature, then an ecological ethic can be fostered more easily.
>
> If man is viewed as an animated machine of physical parts, then nonphysical aspects of his existence are likely to be ignored, that is, in medicine, conditions of employment, architecture.
>
> If man is viewed as spiritual rather than physical, then material aspects of his existence are likely to be ignored, that is, in public health, employment opportunities, housing.
>
> If man's nature is seen as complete and fixed, then his task is to adapt himself and his institutions to that nature.
>
> If man's nature is seen as continuing to evolve, then his task is to understand the nature of that evolution and to design his institutions to enhance that development." (Markley, 1973).

In these examples of alternative views concerning the nature of man, we see impacts of metaphysical ideas on our values and behavior. The metaphysical question addressed in the first pair of examples has to do with relation of subject and object, specifically the relationship of man as perceiver to his perceived world. He either perceives himself as belonging to the world or as somehow a part of it. When he views himself belonging to the world, he has achieved a level of self-reference that perceives the existence of two "I's"--he perceives a subjective "I" beholding an objective "I." But it always requires three "I's" to perceive two, for there is still the "I" that does the perceiving.

When he cannot perceive himself in the world, he perceives himself only as a subjective "I" apart from all else. But again the perceiver of this single "I" is also an "I"; in this case only two "I's" have been realized.

The question addressed in the second pair of examples has to do with the perception of how parts relate to a whole. The true whole may not be perceptible, so the question may involve what parts or portions of the whole are taken for the whole. In addition, this pair of examples has to do with the signification of systems; which subsystems are chosen for emphasis.

The third pair addresses itself to the same question of parts and wholes but with focus on the temporal or process domain rather than on the scale or structural domain. What part of the temporal domain is perceived? Enough to grasp that some evolutionary pattern exists or only a snapshot conveying the impression that the system is static, i.e., is process perceived or only structure?

From these and other metaphysical questions having to do with the original nature and destiny of man and the world, we may abstract six fundamental categories that appear basic to descriptions and classifications of worldviews. (Neither the necessity nor sufficiency of these six categories as a generating base for all philosophical positions is claimed. It is assumed only that these six possess sufficient scope to make them useful in the design of worldview profile inventories.)

The specification of the irreducibles. What are the primaries or undefinables upon which we chose to base all else? Are matter, space and time the primaries? Energy, information and form? Images, thought, number, being? What? What we take as reality depends on our choice of primaries.

The relation of parts to whole. What is the scale or scope of the whole that is perceived--spatially, temporally, hierarchically? What is the relative emphasis given to the parts and wholes? Are parts confused with the whole?

The Primaries
..... Ultimate reality
Love, Wisdom, Memory
Self-reference
Uniqueness (Pauli)
Oneness

The relation of parts to parts. Are parts seen as highly differentiated or interconnected? Do "bridge" relations or "fence" relations between entities dominate?

The relation of structure and process. What range of time or frequency are perceptible? Which systems appear as structures, which as process or flow?

What systems are emphasized? To what extent is importance projected on the nearby and the immediate? How are systems ordered or nested? Does the physical/material system contain all others, does the mental/percept system contain all others?

What is the view of the perceiver/perceived? How is the perceiver viewed in reference to its contexts and to the whole? What levels of self-reference are present? What is the degree of integration of subject and object?

Significantion

appearances/realities is/ought

These six and/or other categories permit the construction of questions which define a worldview using a "top-down" approach. Depending on our orientation with respect to these categories, we may derive the attitudes and values that we are likely to adopt, the policies we would be apt to support and the behavior we most probably would exhibit. But more importantly such a profile is a tool to increase our worldview awareness.

We may render our own worldviews visible through a systematic study of historic worldviews such as those held by Western man at different periods of history. We may do this by placing in juxtaposition various historic worldviews, structured about these categories--those of primitive man, classical man, medieval man, renaissance man, enlightenment man and modern man. Using this trip in time we can become aware of differences that we did not know existed which reveal to us things we held to be absolutes were after all only assumptions. And since we are living at a singular limit point of history--a rare time in which the cultureal worldview is undergoing a deep change--we shall be better prepared to evaluate alternative contemporary views that are candidate replacements of our old core-beliefs.

CONSTITUENTS OF WORLDVIEWS:

The basic questions men have always asked since first they were able to articulate questions, have had to do with who we are, our purpose here, our origins, our destiny, the nature of the world, its beginnings and its processes. These questions have never been answered without resort to employment of beliefs. While a great amount of factual material has been accumulated and many theoretical constructs have been built on it, the foundations for both the observations and the theories still ultimately rest on certain assumptions--on belief systems. Though these questions may be unanswerable, (and the adherents of one worldview consequently discard them, failing to recognize their essential role in energizing cultural activity), they are needful to us in the conduction of our chosen business of ordering that small portion of the cosmos that we directly encounter.

From these questions derive the basic assumptions that are the parameters of our worldviews. We find that we must have an ontology, an epistemology, an ethics, a politics, in fact, we must have assumptions in every field that has been a branch of traditional philosophy. We may list these areas as follows:

Underlying all is the choice of metaphysical system Adi - Buddha
Within this system are four necessary branches:

An ontology containing Vairachona - Akshobya
A cosmology, a cosmogony, and an eschatology

An epistemology containing Amitabha
A logic system, a validation process, a signification process

An axiology containing Ratna Sambhava
A value system, an ethical system, an estheticology

A praxiology containing Amogha Siddhi
An economics, a politics, a technology

FIVE FUNDAMENTAL WORLD VIEWS

1) Nature is an enemy to be subdued
   - The Challenge: to control, to win
   - The Elites: rulers and warriors
   - The Attitudes: arrogance and fear
   - The Virtues: persistence and courage
   - Style of Thinking: black/white, us/them
   - The Diachronic/Synchronic Index is 2

2) Nature is a Bank Account for making deposits and withdrawals
   - The Challenge: Sustainment
   - The Elites: providers of sustenance and healing
   - The Attitudes are protection and balance
   - The virtues are equity and justice
   - Style of Thinking: associative, literal
   - The Diachronic/Synchronic Index is 4

3) Nature is an exemplar for creativity
   - The Challenge: Innovation
   - The Elites: artists and inventors
   - The Attitudes: perfection and pride
   - The Virtues: imagination and originality
   - Style of Thinking: poetic, amorphous
   - The Diachronic/Synchronic Index is 6

4) Nature is a mystery to be explored
   - The Challenge: Understanding
   - The Elites: scientists and philosophers
   - The Attitudes: curiosity and wonder
   - The Virtues: persistence and openness
   - Style of Thinking: logical, abstract
   - The Diachronic/Synchronic Index is 8

5) Nature is a symphony to be heard
   - The Challenge: Transcendence
   - The Elites: no elites
   - The Attitudes: peace and joy
   - The Virtues: inclusiveness and compassion
   - Style of Thinking: parables, metaphors
   - The Diachronic/Synchronic Index is 10

FUNDAMENTAL KNOWLEDGE IN NUMERICAL ORDER
(TO REPLACE TRADITIONAL DISCIPLINES)

ZERO

THE ADDITION-SUBTRACTION IDENTITY

ONE

THE MULTIPLICATION/DIVISION IDENTITY
NAMES OF KINGS AND QUEENS OF ENGLAND HAVING NO SECONDS

TWO

THE TWO SIDES OF A SHIP
THE TWO SIDES OF A CHURCH
THE TWO MAJOR BRANCHES OF ISLAM
PRESIDENTS OF THE UNITED STATES WITH THE SAME LAST NAME (5 pairs)
NAMES OF KINGS AND QUEENS OF ENGLAND HAVING NO THIRDS
RECEIVERS OF TWO NOBEL PRIZES
THE TWO MOONS OF MARS
THE TWO TYPES OF MATTER
KEPLER'S TWO POLYHEDRA

THREE

THE THREE STOOGES
SCROOGE'S THREE GHOSTS
THE THREE MUSKETEERS
THE THREE WISE MEN
THE FIRST TRIUMVIRATE
THE SECOND TRIUMVIRATE
THE THREE BRANCHES OF U.S. GOVERNMENT
THE THREE KINGS RICHARD OF ENGLAND
LORD NELSON'S THREE GREAT VICTORIES
THE TRINITY
THE HINDU TRINITY
THE THREE TEMPTATIONS OF JESUS
THE THREE TEMPTATIONS OF GUATAMA
THE THREE FUNDAMENTAL CONSTANTS
KEPLER'S THREE LAWS
NEWTON'S THREE LAWS
THE TRIVIUM

FOUR

THE FOUR MARX BROTHERS
THE FOUR BEATLES
THE GANG OF FOUR
THE FOUR HORSEMEN OF THE APOCALYPSE
THE FOUR ARCHANGELS
THE FOUR GOSPELS
THE FOUR SEASONS
THE FOUR WINDS
THE FOUR ELEMENTS
THE FOUR HUMORS
HESIOD'S FOUR AGES OF MAN
ARISTOTLE'S FOUR CAUSES
BACON'S FOUR IDOLS
THE FOUR NOBLE TRUTHS
THE FOUR HINDU CASTES
THE FOUR YUGAS
THE FOUR ESTATES
THE FOUR FREEDOMS
THE FOUR MT. RUSHMORE PRESIDENTS
THE FOUR KINGS WILLIAM OF ENGLAND
THE FOUR TYPES OF WARFARE
THE FOUR HORSE PACES
THE FOUR PSYCHOLOGICAL TYPES
THE FOUR FOOD GROUPS
THE FOUR EONS OF GEOLOGICAL TIME
THE FOUR NUCLEOTIDES
THE FOUR FORCES
THE FOUR COLOR THEOREM
FOUR VALUED LOGICS
THE FOUR MODES OF MULTIPLEXING
THE QUADRIVIUM

FIVE

THE RAT PACK
THE FIVE GREAT LAKES
THE FIVE STAR GENERALS AND ADMIRALS
THE FIVE EXTINCTIONS
PLATO'S FIVE POLYHEDRA
THE FIVE SENSES
THE FIVE TATHAGATAS

SIX

THE SIX MAJOR PROPHETS
THE SIX MINOR PROPHETS
THE SIX NATIONS OF THE IRIQUOI CONFEDERATION
THE SIX KINGS GEORGE OF ENGLAND
THE SIX WIVES OF KING HENRY VIII

SEVEN

THE SEVEN DWARVES
THE SEVEN SAMURAI
THE SEVEN ORIGINAL ASTRONAUTS
THE SEVEN DAYS OF THE WEEK
THE SEVEN COLORS OF THE RAINBOW
THE SEVEN CONTINENTS
THE SEVEN SEAS
THE SEVEN WONDERS OF THE ANCIENT WORLD
THE SEVEN HILLS OF ROME
THE SEVEN DEADLY SINS
THE SEVEN SACRAMENTS
THE SEVEN CHAKRAS

EIGHT

THE EIGHT PLANETS
THE EIGHT KINGS HENRY OF ENGLAND
THE EIGHT KINGS EDWARD OF ENGLAND
THE EIGHT IMMORTALS OF CHINA
THE BUDDHA'S EIGHT FOLD PATH
THE PARTICLE PHYSICIST'S EIGHT FOLD WAY

NINE

THE NINE REINDEER
THE NINE MUSES
THE NINE MEMBERS OF THE U.S. SUPREME COURT
THE NINE ORDERS OF ANGELS
THE NINE JUDGES OF THE UNDERWORLD
DANTE'S NINE CIRCLES OF HELL
THE NINE EPOCHS OF GEOLOGICAL TIME
THE NINE INTERROGATIVE PRONOUNS

TEN

THE TEN COMMANDMENTS
THE FIRST TEN AMENDMENTS (THE BILL OF RIGHTS)
KUKAI'S TEN LEVELS OF ENLIGHTENMENT
THE TEN TYPES OF STELLAR SPECTRA
THE TEN MESONS

ELEVEN

THE ELEVEN ERAS OF GEOLOGICAL TIME
THE ELEVEN PERIODS OF GEOLOGICAL TIME
APOLLO 11

TWELVE

THE TWELVE MONTHS
THE TWELVE FULL MOONS
THE TWELVE DAYS OF CHRISTMAS
THE TWELVE SIGNS OF THE ZODIAC
THE TWELVE CHINESE YEARS
THE TWELVE OLYMPIANS
THE TWELVE LABORS OF HERCULES
THE TWELVE TRIBES OF ISRAEL
THE TWELVE APOSTLES
THE TWELVE MUSICAL KEYS
THE TWELVE LEPTONS

THIRTEEN

THE THIRTEEN COLONIES
ARCHIMEDES' THIRTEEN POLYHEDRA
THE THIRTEEN SIGNS OF THE ZODIAC
THE THIRTEEN BARYONS
THE THIRTEEN GUAGE BOSONS

FOURTEEN

THE FOURTEEN ACHTTAUSENDER PEAKS
THE FOURTEEN STATIONS OF THE CROSS

THIRTY SIX

THE THIRTY SIX QUARKS

FIFTY THREE

THE FIFTY THREE STAGES OF THE TOKAIDO

EDNUMB.WPD November 29, 2008

EDUCATION BY THE NUMBERS

CURRENT CULTURE

The 4 seasons, the 7 days of the week, the 12 months of the year
The 4 phases of the moon, the 12 full moons of the year
The 4 directions of the compass, the 7 colours of the rainbow, the 7 continents
The 4 quarters of football, the 9 innings of baseball
The 12 musical keys, the 4 types of musical instruments, the 4 types of pipes
The 9 reindeer, the 7 dwarves, the 4 Marx Brothers, The 3 Stooges

LITERATURE

Aristotle's 4 Causes, Bacon's 4 Idols
Dante's 9 circles of Hell and 7 ledges of Purgatory
The 3 Musketeers, the 7 Samurai,

THE BIBLE

The 10 commandments, the 12 tribes of Israel, the 6 major prophets
The 6 minor prophets, the 4 Archangels
The 12 Apostles, 4 Gospels, the Trinity, the 3 Wise Men

THE GREEKS

The 12 Olympians, the 12 labours of Hercules, the 9 Muses
The quadrivia, the trivia, the 4 humours , the 4 elements, the 4 winds
Hesiod's 4 ages of man

THE ROMANS

The 7 hills of Rome, the first triumvirate, the second triumvirate
The seven wonders of the ancient world

MATHEMATICS

The 4 colour theorem, the 4 types of numbers
Wolfram's 4 classes of cellular organization

SCIENCE

The 4 forces, the 4 nucleotides, the 5 extinctions, the 9 planets
The 4 psychological types, the 4 modes of multiplexing

AMERICA ~6

The 5 members of the Iroquoian confederation, the 13 colonies
The 3 branches of government, the 4 Mt. Rushmore presidents
The first 10 amendments or Bill of Rights, Lind's 4 generations of warfare

13 ED COUNTRIES

EASTERN

The 4 castes in Hindu society, the 4 Yugas, The Hindu Trinity
The 7 chakras
The 4 Noble Truths, the 8 fold path, the 5 Tathagatas
China's 8 Immortals,
Kukai's 10 levels of enlightenment,

EDUCATION BY THE NUMBERS

ONE

KINGS, QUEENS OF ENGLAND (no seconds)

TWO

LAUREL AND WHO?
ABBOT AND WHO?
QUEENS OF ENGLAND, (two pairs)
KINGS OF ENGLAND, (two pairs)
PRESIDENTS OF THE UNITED STATES, (four pairs)
MAJOR BRANCHES OF ISLAM
MOONS OF MARS

THREE

THE THREE STOOGES
THE THREE MUSKETEERS
THE THREE WISE MEN
THE FIRST TRIUMVIRATE
THE SECOND TRIUMVIRATE
THE THREE BRANCHES OF U.S. GOVERNMENT
THE THREE KING RICHARDS OF ENGLAND
THE TRINITY
THE HINDU TRINITY
THE TRIVIUM

FOUR

THE FOUR MARX BROTHERS
THE FOUR BEATLES
THE FOUR HORSEMEN OF THE APOCALYPSE
THE FOUR ARCHANGELS
THE FOUR GOSPELS
THE FOUR SEASONS
THE FOUR COMPASS DIRECTIONS
THE FOUR WINDS
THE FOUR PHASES OF THE MOON
THE FOUR ELEMENTS
THE FOUR HUMORS
HESIOD'S FOUR AGES OF MAN
ARISTOTLE'S FOUR CAUSES
BACON'S FOUR IDOLS

$$\frac{x}{\left(\frac{s}{\alpha\mu}\right)^3} = \frac{(\alpha\mu s)^{3/2}}{s^3(\alpha\mu)^6} =$$

60.72381784

$$\frac{x}{114} = \frac{60,723\,818}{124,828\,858}$$

$$= s^{3/2}(\alpha\mu)^{-15/2}$$

$$x = s^3 s^{3/2}\frac{(\alpha\mu)^{3/2}}{(\alpha\mu)^3} \cdot \overline{s^3(\alpha\mu)^6} =$$

y = 55.789 365

$$x = \left(\frac{s^3}{(\alpha\mu)^{15}}\right)^{1/2} = \left(\frac{s}{(\alpha\mu)^5}\right)^{3/2}$$

50.580151

22.998 023 354

33

17

6

$\frac{4}{10}$

$s^{3/2}$ = 59.033 20667

$\alpha^{15/2}$ = 8.4530558

50.58015081 = x

60.

55.789365

29.078257

84.867622

$$\left(\frac{s}{\alpha\mu}\right)^3 = 114.685191$$

60.723818

175.409009

64.105040

111.303964

$\frac{x}{114} = \frac{60}{124}$

y 50

1 1 1

R D A 60

40

$\frac{60}{124} = \frac{x}{114}$

$\frac{60 \cdot 114}{124}$

40.482

1.127

41.609

42.836

$s(\alpha\mu)^2$

85.672

84.867

.805

29

55

84

42

$s^2(\alpha\mu)^4$

THINKWAYS.WPD March 11, 2011

COGITANS

We shall require a substantially new way of thinking if mankind is to survive.
–Einstein

:The task is not so much to see what no one has yet seen, but to think what nobody has yet thought about what everybody sees.
–Schrödinger

PREQUESTIONS
- From juxtapositions,
- From discriminations,
- From new discoveies, inovations, and art
- From searching

QUESTIONS
- Nine interrogative pronouns
- Questioning existing questions
- Unanswerable questions

PROBLEMS
- Is to should

ANSWERS
- Single
- Two
  - ISSUES
  - Compromise or Synthesis
  - Eristics or Ballistics
- Multiple

ALTERNATE WAYS TO THINK

- LOGICAL THINKING
  The classical mode of western thought first systemized by Aristotle. It forms the basis of mathematical, scientific, and systems thinking, and to some extent is an ingredient of theological and legalistic thought. The concept of proof is unique to this mode of thinking. It begins with postulates, derives consequences by rigorous deductive canons, and posits it conclusions as being proved. Its limitations have been demonstrated by Russell, Whitehead and Godel.

- ANALYTIC THINKING
  The top-down application of logical thinking.

- SYNTHETIC THINKING
  A bottom-up constructionist approach using such methods as juxtaposition, association, and metatphor. Multi-leveled, but not necessarily Machian.

- PATTERN THINKING
  Consider the overall pattern and even though certain links may be missing, continue to construct a self-reinforcing whole. This type of thinking is exemplified by Sherlock Holmes' approach to solving murder mysteries. It includes such questions as motivations, who stands to gain, to lose. This approach is oftimes used in courts for evidence, but is never to be regarded as constituting proof.

- JUXTAPOSITION THINKING
  Placing items in juxtaposition and reading the space between them. It is useful for investigating possible commonalities, establishing alternate linkages and for synthetic thinking in general. It is an anecdote to associative thinking in that it may generate counter-intuitive or anti-associations. For example, if we generate a set of cards each containing an item and place cards in juxtaposition in various combinations, sometimes hitherto unsuspected commonalities are revealed and in the "space between the cards" we may discover something we did not previously suspect.

- REDUCTIONIST THINKING
  This approach assumes a bottom-up causality, the properties of the parts determining those of the whole. It is deficient in accounting for the emergence of new properties which arise in aggregates of the elements.

- EXTERNAL CAUSALITY THINKING
  This approach involves bringing in contextual elements and allowing for tree-like causalities. For example, astrologers claim the existence of a causal linkage between the orbital cycles of heavenly bodies and the physiological and

psychological rhythms of living organisms. Science recognizes some of the correlations, but rejects causal linkages. The ExCaus approach postulates a third external source of cycles which supplies the zeitgeber for both planets and biorhythms.

- STOCHASTIC THINKING
  Fuzzy sets

- SERIAL THINKING
  Linear, one level, and inferring a deterministic infrastructure. The basic format of most pedagogy and stories. The essence of our worldviews re evolution, history and progress.

- PARALLEL THINKING
  Both horizontal (independent modules to be used in juxtaposition and assembled into any meaningful congeries or hierarchies) and vertical (parables and multi-level stories).

- ASSOCIATIVE THINKING

- METAPHORICAL THINKING

- EXPANSIVE-CONTRACTIVE THINKING

- PEDAGOGICAL THINKING

- HISTORICAL THINKING

- HEURISTIC THINKING

- CONTEXTUAL THINKING

- TOP DOWN THINKING

- BOTTOM UP THINKING

- INDUCTIVE THINKING
  An asymmetrical method which is restrictive in validation but conclusive in falsification. (Popper)

- SERENDIPITY

VOCAB3.WP5 DISK:MATHPROGRAM 01/10/90, 11/03/90

REPETITION

THE INPUTS TO THE SYSTEM AND THE OUTPUTS OF THE SYSTEM REMAIN THE SAME.
CYCLES ARE IDENTICAL.
SYMBOL: A CLOSED LOOP.
EXAMPLE: PLANETARY MOTION.
PARAMETERS: CYCLE NUMBER.

ITERATION

THE OUTPUT OF THE SYSTEM BECOMES THE NEXT INPUT TO THE SYSTEM.
WHILE THE SYSTEM OPERATION REMAINS THE SAME EACH OUTPUT IS DIFFERENT.
SYMBOL: A SPIRAL, A HELIX, OR A SET OF CONCENTRIC LOOPS.
EXAMPLE: GROWTH, EVOLUTION, CHAOS
PARAMETERS: CYCLE NUMBER, INPUT, OUTPUT

RECURSION

PART OF THE OUTPUT OF THE SYSTEM BECOMES THE NEXT INPUT TO THE SYSTEM.
THE 'REINVESTED' CHANGES SCALE, THE RESIDUE COLLECTS OR IS CONSUMED.
SYMBOL:
EXAMPLE: OM MANI PADME HUM, WHERE HUM = OM MANI PADME HUM
PARAMETERS: CYCLE NUMBER, INPUT, OUTPUT, PART, WHOLE

NESTING

A DISCREET FORM OF ITERATION

REGRESSION

A DISCREET FORM OF ITERATION OR RECURSION

EQUALITY

$A \geq B$ AND $A \leq B$ INFERS $A = B$

MUTUAL CONTAINMENT

$A \geq B$ AND $A \leq B$ DOES NOT INFER $A = B$
IN FACT WE MAY HAVE $A > B$ AND $B > A$ BOTH VALID.

There are evidently many species of iteration and recursion. Where does transformation fit in? Where does the Great Dialectic fit in?

NEWTHINK.WP6

NEW THINK

CONCEPTS [META-INJUNCTIONS]	VALUES [INJUNCTIONS]
RECIPE --> COSMOS	PRACTICE GANDHIAN GLASNOST
NODE/LINK/TRAFFIC/TOPOLOGY	'FRANCHISE' ALL OPERATIONS
BOOTSTRAP/SPACE STATION	INCLUDE SUNSET CLAUSES
FACETISM	HOLD ALL BEINGS IN REVERENCE
MORPHOLOGY: ALL NOT ONE	DEVELOP DON'T DISSEMINATE
HIERARCHY: THE VERTICAL	ITERATE DON'T REPEAT

HERE/NOW VS EVERYWHERE/NOWHERE
MINIMUM REDUNDANCY IS SET BY REPAIRABILITY NOT BY LOAD
SELF REFERENCE

APHORISMS
EVERYTHING IS A SPECIAL CASE

~

ITEM	TRINITIES [THE THREE JEWELS]
JAIN	RIGHT FAITH, RIGHT KNOWLEDGE, RIGHT CONDUCT Note: Jaina maps onto Cybernetics
BUDDHIST	BUDDHA, SANGYA, DHARMA
HINDU	BRAHMA (CREATOR), VISHNU (PRESERVER), MAHESA (DESTROYER)
CHRISTIAN 1.	FATHER, SON, HOLY SPIRIT
2.	GOD, THE BIBLE, THE CHURCH
3.	THE TRANSCENDANT, THE CHRIST, THE IMMANENT

ISLAMIC	ALLAH, THE PROPHET, THE QURAN
JUDEAIC	GOD, THE HOLY SCRIPTURES, THE HOUSE OF ISRAEL
CYBERNETIC	THE NORMAL, THE AMBIENT, THE MODIFIER

Trinities appear to be of three distinct types. The first type is a manifestation of the stability attribute of three-foldedness, e.g. a tripod. Examples of this from the above list are the Judaic, the Christian 1. and 2., and the Islamic. The second type is a manifestation of the dynamic that derives from the residual asymmetry of an odd number. Examples of this from the list are the Buddhist and the Christian 3. The third type involves an element on one level arbitrating balance and imbalance between two elements on a second level. Examples of this are the Jaina and the Cybernetic.

The type two trinity involves a departure and return temporal pattern. There must be alternation between dialog and identity. God must be alternately Transcendent and Immanent. If God is never immanent, one becomes a hardened dogmatist. For a transcendent God is too remote to manifest and sustain knowledge of His true nature. If God is never transcendent, one becomes as Lucifer, believing in their own personal godheadedness, and mistaking their own voice for that of God. In both cases contact with God is lost.

Prayer is the path to the transcendent God, it is the dialogue of speaking and listening. Meditation is the means to become one with the immanent God. Prayer and Meditation, Transcendence and Immanence, the Great Departure and Return.~

ITEM NEW CONCEPTS AND TOOLS OF THOUGHT EFFECTING WORLDVIEW CHANGE

NEW CONCEPTS	TOOLS OF THOUGHT
GAME THEORY	NON-ZERO SUM GAME
BOOTSTRAP COGNITIVE STRUCTURES	NO PRIMARIES
SELF REFERENCE	ITERATION/REPETITION
HIERARCHY	MACROS

NODE/LINK/TRAFFIC/TOPOLOGY	ENTITY/RELATIONSHIP
ALGORITHMS	PROCESS/PRODUCT
HOLOGRAMS	EVERYTHING IS CONNECTED
CRITICAL MASS	100th MONKEY
ENERGY,ENTROPY,INFORMATION SECOND LAW	MORPHOLOGY/GENERALIZATION MATRICES, TREES, NETWORKS
QUANTUM REALITY	EXISTENCE/NON-EXISTENCE
LIMITS, e.g. c	GODEL'S THEOREM
TIME	PARADOX
SPACE	SIGNIFICATION
ADDRESS/CONTENT	SYSTEMS ALLOMETRY
HARDWARE/SOFTWARE	INSTINCT/LEARNING~

ITEM OLD THINK

CURRENT IDEAS LEADING TO ILLUSION, SELF-DECEPTION, HYPOCRACY, DISEASE

COLLECTIVE AND PERSONAL

NOT INVENTED HERE
LABELISM
ONE SET OF RULES FOR ME, ONE FOR YOU
MASTER RACE ELITISM
FINALISTIC LOGIC
NEED FOR AN ENEMY
IOD FEEDBACK
ACTION AT A DISTANCE

MIXING LEVELS
JUSTIFICATION FOR NON-ACCOUNTABILITY
ALL OR NOTHING THINKING
OVER GENERALIZATION
DENIAL, MENTAL FILTERS
MAGNIFICATION/MINIMIZATION~

ZOOMZONE.WPD

ZOOM ZONES

Introduction

The zoom lens is an excellent metaphor for the many ways in which we view the world. The internalization of experience involves not only what we look at, but also involves the resolving power and field of view with which we choose to look. In a general sense when we zoom in onto the details of some specific event we enter a zone of emotion and feeling. When we zoom in close to a personal tragedy we identify with those who suffer and are filled with feeling. But on zooming out the tragedy blurs and then becomes but a statistic. It is as though feeling morphs to thinking and the heart morphs to the intellect as the field of view grows larger. There are thus various *zoom zones* with which we experience the world.

Most of the time our zoom range is very limited. We tend to have but two or three fixed range settings. One for the regularly recurring events of everyday life, one for special rare but familiar events, and one for the highly unusual and unexpected. In each zone there are dominant feelings and dominant ways of thinking.

of VALUES w
WIDTH OF HERE
and
w
WIDTH OF NOW

Some Zoom Zone notes:
There are many parameters, spectra, or vectors along which a zoom can range.
Is scale a special case of zoom, or the basic parameter in all zoom?
It appears many times that zooms reduce to the purely historical

A Person Zoom

Friends and relatives
Professionals
Political leaders, celebrities,
current heroes, the "news zone"

The famous of History, Saints, Explorers, Artists, Inventors
Great Sages and Teachers
Those for whom history alone does not suffice, their lives demand mythic augmentation

An Intellect Zoom

Archimedes
Leonardo da Vinci
Newton
Einstein

And there are those who enter a zone in which madness occurs:
Cantor, Gödel, Nash, etc.

A Spiritual Zoom

Moses
Lao Tzu
Maha Vira
Zarathustra
Muhammad
Shantideva
Gautama
Jesus
.....

A Logical Zoom

Pythagoras
Aristotle
Venn, Boole
Russell, Whitehead
Gödel

The Light Darkness Zoom
In certain zones of some spectra,
the gods can speak to us, "When we have faces then we can meet them face to face"
That is there are zones in which parts and wholes can communicate, and zones in which one

vector can interact with another.

There are insanity zones, paralysis zones, action zones, transformation zones, recognition zones, and zones of despair.
(Woody Allen zones)

There are difference in time rates within and between zoom spectra. Time rate can itself be a zoom parameter.

In all there is the matter of "breathing", the importance of zooming in and zooming out. The dialectic of departure and return.

Scale Waves
Zooming discloses fractal structure in many parameters. It is as though the zoom path is like a wave with the crests producing existence and the troughs producing gaps.

The most puzzling results of zooming come from scale wise inconsistencies. A set of consistent laws seen at one zoom setting falls apart at a different setting. [eg quantum mechanics] It is very doubtful that there is not also a change in rules from the meso to the macro as there is from the micro to the meso. Contiguity may require consistency, but gaps liberate the universe from consistency.

The merging of *contexts* reveals inherent inconsistencies is the structure of the universe.
At some zoom settings the resolving power is such that objects merge. Things that are really distinct appear as one. There is the old question, Is mathematics invented or discovered? At a critical zoom setting this question is meaningless for

Invention _ Discovery

Does zooming encounter "curtains" inhibiting further ranging? Or can certain zooms see beyond the curtains ?

The vectors, spectra, or dimensions or zoom are both outer and inner and there are many symmetries.

The existence of discrete zones leads to fractals and hierarchy. Continuity and contiguity break down at various zoom settings.

One set of rules for us and another set for them seems to be common in the universe.

What is consistent at one zoom setting is inconsistent at another. And what is packaged at one resolving power is depackaged at another.

That which is viewed as individual and different at one setting is but one at another setting. Racism and genderism [a more inclusive term than sexism] are the results of a fixed zoom setting.

In this age dominated by electronic media, with most people sitting several hours a day before their TV sets, the distinction between what constitutes **entertainment** and what constitutes **education** has become somewhat blurred. Certainly TV is a medium of entertainment (at least once in a while), and many hold that TV is also a medium of education. What really is the difference between education and entertainment? Is there a difference? To assess whether a medium programmed as commercial TV, or for that matter, as Public Broadcasting, can educate, we must understand the essential distinction between education and entertainment. It is not that entertainment is usually interesting and amusing and that education is traditionally dull. Certainly education can and should be interesting and never need be devoid of humor. The difference between entertainment and education has nothing to do with being or not being interesting. It has to do with what we might call **enabling.** What this means is that education builds on itself--it is **self-referential.** It is structured stepwise. One must mount the first step before the second can be taken. Each step is essential for enabling the ones that follow. Entertainment, on the other hand, does not require this type of enabling. One can tune in any time and within a few seconds be with it. And when the program is over you are on the same level as when it began. True, you may have had a trip, but not a journey. And the difference between a trip and a journey is that after a trip you are back at the same old place, but after a journey you are somewhere you have never been before and enabled to do things you never could do before, and perhaps most important enabled to take journeys (and trips too) that were unavailable to you before. But even if your thing is taking trips, education enables you to take better ones.

Enabling involves preparation. It is oriented toward some future product. In this sense education is like production. It is a mode of creating wealth and if option space is the true measure of wealth, education produces wealth. Entertainment, on the other hand, is not future oriented, it is now oriented --instant gratification. It is an end in itself and is thus like consumption.

What's wrong with astrology, if attribute everything to phase and nothing to frequency.

Each planet represents a different frequency
Phase are referred to fixed stars (zodiac)
and to one another (eg quadrature, trine)

EPISTEMOLOGICAL ANALYSIS OF THE INFORMATION OVERLOAD PROBLEM:

Many of the problems outlined above in connection with information overload demand a study of certain basic philosophical problems in order to determine what solution would be desirable - it is even open to question whether the improvement of information assimilation would create a good effect. It has been shown by Bevelas that when the amount of communication and information flowing through an organization increases above a certain point, the effectiveness of the organization begins to drop off.

In addition to the classifal problem of epistemology "What is knowledge?" there has emerged as a matter of increasing relevance in today's world "What is the optimum rate of generation and assimilation of knowledge for human welfare" and "what absolute amount of knowledge constitutes a "barrier" like the sonic barrier beyond which the addition of more knowledge leads to less control over our environment and our future. To answer this question we have to examine how knowledge is developed and how it is used. We have to examine the different types of knowledge and the different types of experience on which they are based. For example, the humanities are derived from man's personal and social experience, and are consequently understood and appreciated by all men, whereas the sciences are derived from artificial controlled laboratory experience which might be quite alien to the experience of all men.

Many outlines of how modern high speed computers can be used as the nucluei and the basis of automated libraries, one would simply formulate a question, and dial for the answer, savings hours of circling through file catalogues and book stacks. Applications of such computer information centers to the requirements of several professional groups have been proposed by many studies. For example, doctors could list the symptoms of a patient, feed them into a computer, and receive diagnosis. Educators could find the latest references on their particular lectures. Research groups could save thousand of man hours by having available within minutes not only specific pieces of data, such as the conductivity or coefficient of expansion of certain alloys, but also information on what groups are conducting what research. And for the layman to have an encyclopedia of a passive nature supplying instantly the answer to any question he might have would be a great boom (such a passive encyclopedia, of course, does not substitute in the roles of recording stimulation that an active encyclopedia which presents articles without being questioned

Another possibility is the use of information centers in democratic processes not only for informing voters all of the relevant information on given issues, as a supplement to daily press, but computers can also be used to aid in the polling by congressmen of his constituency.

Finally if the trent toward miniaturization continues we can visualize the augmentation of the human memory with a "pocket memory" storing millions of bits of information, just as today we augment eyesight with spectacles and hearing with hearing aids.

But in addition to tehhnological solution to information overload aid can be derived through the introduction of new procedures. In solving the problem of urban transportation we find we can move more people from one location to another by putting in more freeways, having automobiles capable of higher speed, but is also possible to move more people from one location to another by employing devices such as the "pulsing" of traffic, or placing of individual vehicles on convoy carriers. Analagous to this second type of aid there are several devices available to us in the fiedd of epistemology. For example, we may search for the conceptual ingredients which are common to many diverse branches of knowledge. And extract these "metaprincipals", upon which other facts depend and from which the factual matter may be derived. Just as the day by day positions of heavenly bodies in their orbits may be completely derived from the six orbital elements. We may think of metaprincipals bearing the same relation to facts as facts bear to data. In this connection we may think of the newly emerged science of cybernetics as being "metascience" in that the principals embodies in cybernetics underly the structure of several branches of science, such as, electronic network theories, neurology, and social dynamics. The oldest and best known example of a metascience is mathematics which may be operative wherever quantatative aspects may be abstracted from phenomona. We must ask in extending the concepts of a metascience to other aspects of besides quantatative aspects what system of relationships are involved. It is visualized that a metascience based on fundamental concepts, such as replication feedback,

may be synthesized and an algebra relating these concepts constructed.

THE AUTOMATION OF INFORMATION

While the rate of accumulation of human knowledge has continued to increase the methods of storing it have changed little since the days of Gutenberg. However the demands of high speed electronic computers and the television industry (video tape) have necessitated the development of techniques for rapidly storing and retrieving vast amounts of information. These techniques are available to organizations like Encyclopaedia Britannica. For example the General Electric Co. has proposed an information center which they say could handle the equivalent of the Encyclopaedia Britannica daily. Straws in the wind indicate that we are about to see another break-through that will have an impact on the spread of knowledge even greater than that of moveable type.

Several years ago it was proposed that the federal government establish a BUREAU OF INFORMATION, TECHNICAL AND SCIENTIFIC ("BITS" for short). This bureau was to: 1. Collect, 2. Process, 3. Store, and 4. Disseminate, Technical and Scientific information. It occurs to us that many of the features of the BITS are applicable to the Encyclopaedia. The Processing Branch was to have eminent scholars culling the raw information as received and rewriting it into a logical monolithic system of knowledge. This the Encyclopaedia already has. The storage was to be fully automated, using the latest available techniques and this would be applicable to the Encyclopaedia. The dissemination was also to be as automatic as possible. It was proposed that each group of engineers and scientists have a console for which they would pay a monthly fee, and a service charge for time of actual use. The console would

be equipped with TV screen for slowly scanning strip films, which could be stopped for photographing, for viewing motion pictures or live performances such as the test of a space vehicle. Sound could be received at normal speed for audition or at higher speeds for quick recording. Facsimile recording of charts and pictures would also be provided. The equipment would be controlled with the keyboard equivalent of a telephone dial. The index would appear on the TV screen as the operator continued to narrow down his search.

It is suggested that the Encyclopaedia Britannica divide their service into two parts, one for the professional man, which could be patterned directly after BITS, and the other for the layman, which would be much less pretentious, using the telephone lines, rather than a TV channel or cable, and transmitting stills, voice, and a slow scan. The billing would be done as part of the telephone service. As a start, only information between the last year book and five minutes ago (if important enough !) would be available.

There is no doubt about Information being Automated. The only question is, who is going to do it first.

THE CRISIS IN HUMAN KNOWLEDGE

Today we are faced with two types of revolutions. One has been termed the Explosion of Knowledge. If we measure the production of knowledge by the number of research papers produced, it has been estimated that the total amount of human knowledge has doubled in the past thirty years. The second revolution has to do with the development of new high speed techniques for communications and storage of information. This is another step in the long sequence of revolutionary developments of the line of the development of speech, invention of writing, and the development of printing with movable type.

The problem of overload of information caused by the first revolution has many aspects, some of which bear the mark of urgency in that they tend to develop of forces which will reshape our culture outside of our own will.

1. The rate of creation of new knowledge vastly exceeds the rate of assimilation of knowledge, whereby assimilation is meant the dessimination of knowledge, the verification, the evaluation, the classification, and the incorporation of the new knowledge in education. Assimilation might also mean even the awareness of the existence of the new knowledge.

2. The information overload is creating an obsolescence in education. It has been estimated with a present rate of generations of new facts that the average technical man's education becomes obsolete every ten years. And a man must re-educate himself at least three times during his working lifetime in order to remain effective.

3. The development of extreme specialization is a natural consequence of the information world. All aggregates in nature tend to fragment when they

reach a certain size. Specialization is the manifestation of this general principal in the aggregation of facts. The result of this over-specialization has been the loss of communication between specialists, and has resulted in frustration in research involving unnecessary duplication of effort where problems are conceptionally identical, but sematically different.

4. The information overload has resulted in the development of esotericism with a consequence that large sections of the population have been rendered ineffective in understanding and making contributions to society. Scientific knowledge has been playing the most important role in changing the world. Yet the percentage of the world's population to understand the forces involved is minute. This poses a threat to the democratic idea where people are called upon to make judgment in areas where they lack understanding or where people abdicate their right to make judgment because of their lack of understanding. Esotericism is due not only to the large amount of new knowledge, but also to the complex nature of the new knowledge which in many fields demands years of concentrated study in order to master it. So most people must be left in the realm of non-understanding because of a lack of time or the difficulty of a subject or the lack of availability of new knowledge in suitable form for general dessimination.

Dr. Openheimer in a recent statement to the press stated that unlike in Newton's day when the developments of science could be readily understood by everyone, and everyone could participate in the excitement of new discovery, today it is impossible even to communicate the new ideas being generated to others and specialists in the immejdiate field. This is resulting in a gradual chasm between science and humanity.

5. Another result of the information overload is the gradual shift in emphasis in human experience. Up until the present century most of the lives of individuals was spent in first hand experience with the external world. Today most of our experience is vicarious in which we deal not with the real world at all, but with the experiences of the body of knowledge itself as revealed to us in various communication media. This synthetic experience with the conceptual world instead of with the perceptual world is resulting in the growth of the chasm between man and nature.

6. The information overload is creating a crisis in education. In addition to the problem mentioned above concerning the obselecense of education, there is the problem of what to teach. In the past it has been possible to prepare students to face the world. But with the world changing so rapidly no educator can tell a student what world he must be prepared to face, much less how to face it.

The future, if these various trends continue appears to be crossed by many chasms separating man from man, and rendering it impossible to retain control over himself and his environment which science has afforded man up to the present time.

THE SUBPROBLEMS IN INFORMATION OVERLOAD:

1. The basic problem is to devise methods to increase the rate of assimilation of new knowledge. This focuses primarily on the problem of the classification of knowledge, since the techniques of storage and communication have been developing rapidly and appear to be adequate for present and anticipated

requirements. The bottleneck is the synthesis of a system of classification which possesses the properties exhibited by successful research scholars.

Systems of classification, such as alphabetical classification, the dewey decimal systems used in libraries, the various systems of cross referencing, are artificial in the sense that they bear no relation to the essential relationships between the entities represented, but are based on properties of the semantic representation. A really effective classification system must be based on the characterizing parameters of phenomona and not on properties of the words or pigeon holes that we use to define these phenomona. Ideally what is sought is a classification system which affords a one-to-one mapping of the conceptual world of human knowledge onto the real world from which it is derived.

There are several possible approaches to the construction of such a classification system - which we may call a platonic system because of Plato's use of

The first approach is to synthesize a classification system through a hierarchy of SEQUENTIAL iterated dichotomics starting with Kant's basic division between phenonoma and noumena. The second approach is to characterize concepts searching for "minimal concepts" which defy further subdivision. Treating concepts as "black boxes" which are building blocks for more sophisticated concepts. The problem here is to derive an algebra of concepts in which the characterics distilled from phenomoma are not only the measurable characteristics which are representable mathematically but are characteristics which may bear relationships to one another other than the basic quantitative relationships.

The third approach is to utilize directly classification, schema, where the isomorphism with the real world is well known, as for example in the classification

organic compounds.

A second general approach to the problem of synthesis of a classification scheme is the application of the technique which has been successfully employed by Simon Newell and others in the "teaching" of computors to prove theroms in Euclidean geometry. This technique consists of examining the processes which people go through in the actual derivation of such theorom. A group of twenty or thirty students are asked to derive certain theoroms in geometry. They are equipped with a microphone, asked to think out loud so that every thought proces s in their consciousness is recorded ~~orally~~ verbally. The tape recordings are then analyzed and abstracted to give a program in which the machine is taught to emulate the steps taken by the human being in solving the problem. This in effect is a learning process which can be used ~~on any system~~ to emulate any human mental operation which can be described verbally. With regard to the classification problem this technique could be used to examine the concept association pattern of successful scholars and researchers, (And unsuccessful ones ,) to derive associations which could be supplied to the computer's memory.

A third general approach to the problem of a synthesis of a classification system is the operational approach in which knowledge is defined as the process by which we ascertain new knowledge. Through the study of this process, and growth of knowledge we can discover relationships between existing facts and how they lead to new facts, which is an important part of a classification system which must be dynamic in order to be effective.

It is important to understand the limitations of each type of classification system. The characterizing parameters of a classification system must be ascertained

and some measure of the load handling capabilities and thoroughness of a classification system must be derived.

One of the most effective methods used in abstracting is the "key word" method. This is directly related to the idea mentioned above of an algebra of concepts.

EPISTEMOLOGICAL ANALYSIS OF THE INFORMATION OVERLOAD PROBLEM:

Many of the problems outlined above in connection with information overload demand a study of certain basic philosophical problems in order to determine what solution would be desirable - it is even open to question whether the improvement of information assimilation would create a good effect. It has been shown by Bevelas that when the amount of communication and information flowing through an organization increases above a certain point, the effectiveness of the organization begins to drop off.

In addition to the classical problem of epistemology "What is knowledge?" there has emerged as a matter of increasing relevance in today's world, "What is the optimum rate of generation and assimilation of knowledge for human welfare" and "what absolute amount of knowledge constitutes a "barrier" like the sonic barrier beyond which the addition of more knowledge leads to less control over our environment and our future. To answer this question we have to examine how knowledge is developed and how it is used. We have to examine the different types of knowledge and the different types of experience on which they are based. For example, the humanities are derived from man's personal and social experience, and are consequently understood and appreciated by all men, whereas the sciences are derived from artificial controlled laboratory experience which might be quite alien to the experience of all men.

We must also look into the history of knowledge, knowledge becoming possible through the development of "race memory" which in turn is a consequence of a certain level of communication. In fact, the level of knowledge is a function of the communication capacity and memory storage capacity. This is evident by considering the revolutions in human society which took place with the development of speech, writing, printing, media of mass communication, mass production of books, and now the computer.

A block diagram of the epistemological process would consist of sensor elements focused on certain aspects of the external world, fed through epistemological filters to a resevoir of knowledge. The addition of new knowledge comes from, (a) utilization of the senses for reflection of the real wordd, or (b) contemplation of the resevoir of knowledge itself (theorizing).

One of the basic epistemological problems underlying the generation of a classification system is the morphology of possible epistemological systems. Whether a monistic classification system is possible, whether an isomorphic classification system is possible, depends on the morphology.

SOME DIRECTIONS FOR SOLUTIONS OF THE INFORMATION OVERLOAD PROBLEM:

Three general directions toward a solution are indicated. A first is through technology. The use of computers and automazation of communication of storage processesd is being proposed by several groups as a method for handling the information overload problem. For example, General Electric's CSPA

Many outlines of how modern high speed computers can be used as the nucluei and the basis of automated libraries, one would simply formulate a question, and dial for the answer, savings hours of circling through file catalogues and book stacks. Applications of such computer information centers to the requirements of several professional groups have been proposed by many studies. For example, doctors could list the symptoms of a patient, feed them into a computer, and receive diagnosis. Educators could find the latest references on their particular lectures. Research groups could save thousand of man hours by having available within minutes not only specific pieces of data, such as the conductivity or coefficient of expansion of certain alloys, but also information on what groups are conducting what research. And for the layman to have an encyclopedia of a passive nature supplying instantly the answer to any question he might have would be a great boom (such a passive encyclopedia, of course, does not substitute in the roles of recording stimulation that an active encyclopedia which presents articles without being questioned

Another possibility is the use of information centers in democratic processes not only for informing voters all of the relavant information on given issues, as a supplement to daily press, but computers can also be used to aid in the polling by congressmen of his constituency.

Finally if the trent toward miniaturization continues we can visualize the augmentation of the human memory with a "pocket memory" storing millions of bits of information, just as today we augment eyesight with spectacles and hearing with hearing aids.

But in addition to tehhnological solution to information overload aid can be derived through the introduction of new procedures. In solving the problem of urban transportation we find we can move more people from one location to another by putting in more freeways, having automobiles capable of higher speed, but is also possible to move more people from one location to anothe r by employing devices such as the "pulsing" of traffic, or placing of individual vehicles on convoy carriers. Analagous to this second type of aid there are several devices available to us in the fiedd of epistemology. For example, we may search for the conceptual ingredients which are common to many diverse branches of knowledge. And extract these "metaprincipals", upon which other facts depend and from which the factual matter may be derived. Just as the day by day positions of heavenly bodies in their orbits may be completely derived from the six orbital elements. We may think of metaprincipals bearing the same relation to facts as facts bear to data. In this connection we may think of the newly emerged science of cybernetics as being "metascience" in that the principals embodies in cybernetics underly the structure of several branches of science, such as, electronic network theories, neurology, and social dynamics. The oldest and best known example of a metascience is mathematics which may be operative wherever quantatative aspects may be abstracted from phenomona. We must ask in extending the concepts of a metascience to other aspects of besides quantatative aspects what system of relationships are involved. It is visualized that a metascience based on fundamental concepts, such as replication feedback,

may be synthesized and an algebra relating these concepts constructed.

Finally, we must consider the signal to noise ratio in knowledge. We must not confuse papers published with real contributions. We must develop criteria for filtering the significance from the superficial. Else we are lost in a mire of detail.

This become especially important for the future of education. No longer is it possible to teach specific facts which will be of universal use. Education must consist of instruction in metaprincipals which may be applied to a large variety of situations. Especially of fundamental importance is education in how to solve problems, how to detect and formulate new problems in the rapidly evolving world. This is best done by formulating an education which parallels a specialty with the metaprincipals. The metaprinciples can be understood and illustrated by the specialty, and it can be shown how each specialty may bej derived from the meta-principle. Such an education would prepare the individual for the eventuality of radical change or the eventuality of need in his own specialty.

Some of the characteristics of a classification scheme useful for an encyclopedia :

It must span all knowledge.

It must be dynamic, in that it can assimilate new knowledge.

It must be isomorphic to the real world and representative of the typical human cognitive associations.

It must be capable of various degrees of detail.

It must have high speed and high information load capacity.

SIGNIFICATIONS

SIGNIFICATIONS

You must be your own significator ~ Buddhan injunction to Ananda

A CALL FOR SIGNIFICATION MANIFESTO

This is a call for you to articulate and evaluate the most significant things that your life has thus far taught you. What in your personal first hand experience has impressed you as being the most important lessons of your life? What has life given you, what has it taken from you, where stands the balance? What do you now feel sure of, what remains uncertain? What is resolved, what remains unresolved? What are your deepest satisfactions, your deepest concerns? Forget the conventional answers, the conventional creeds, the conventional issues. Find your own uniqueness, find where you are, and perhaps get a glimpse of who you are.

This is not an exercise for those facing death, it is an exercise for those facing life. The ancient sage said that an unexamined life was not worth living, but gave us no guide lines for examining life. That is at it should be. Each must develop his/her own guide lines, do their own significations. You may not be the final judge, but you should be the primary judge of your life. We ~~avoid our~~ become support irresponsibilities when we delegate judgement to some yet to come final judge.

As for signification: On the biological level it is concerned with pain and pleasure, on the psychological level with what is of interest and of no interest, on the societal level with what is important and unimportant, on the material level with what works and what doesn't work, on the cultural level with what is factual and fictitious, on the spiritual level with what is valid (transforming) and invalid (imprisoning), and on the cosmic level with what is True.

People Stories

Some of My Significations:

- We aren't going to make it until we all make it. unless
- Buddhas last injunction to Ananda
- Pelagius belief in Man
- Self Help w Grace
  What is Freedom?

Build a soul - Gurdjieff w Reincarnation Ushanish

Issues:
How to handle betrayal
Beyond Fairness

Public Experience (communication)
Restricted Experience
Private Experience

Necessary w Sufficient
Unique w Common (Science)
Salvation w Theosis
Liberation
Apollo & Dionysius

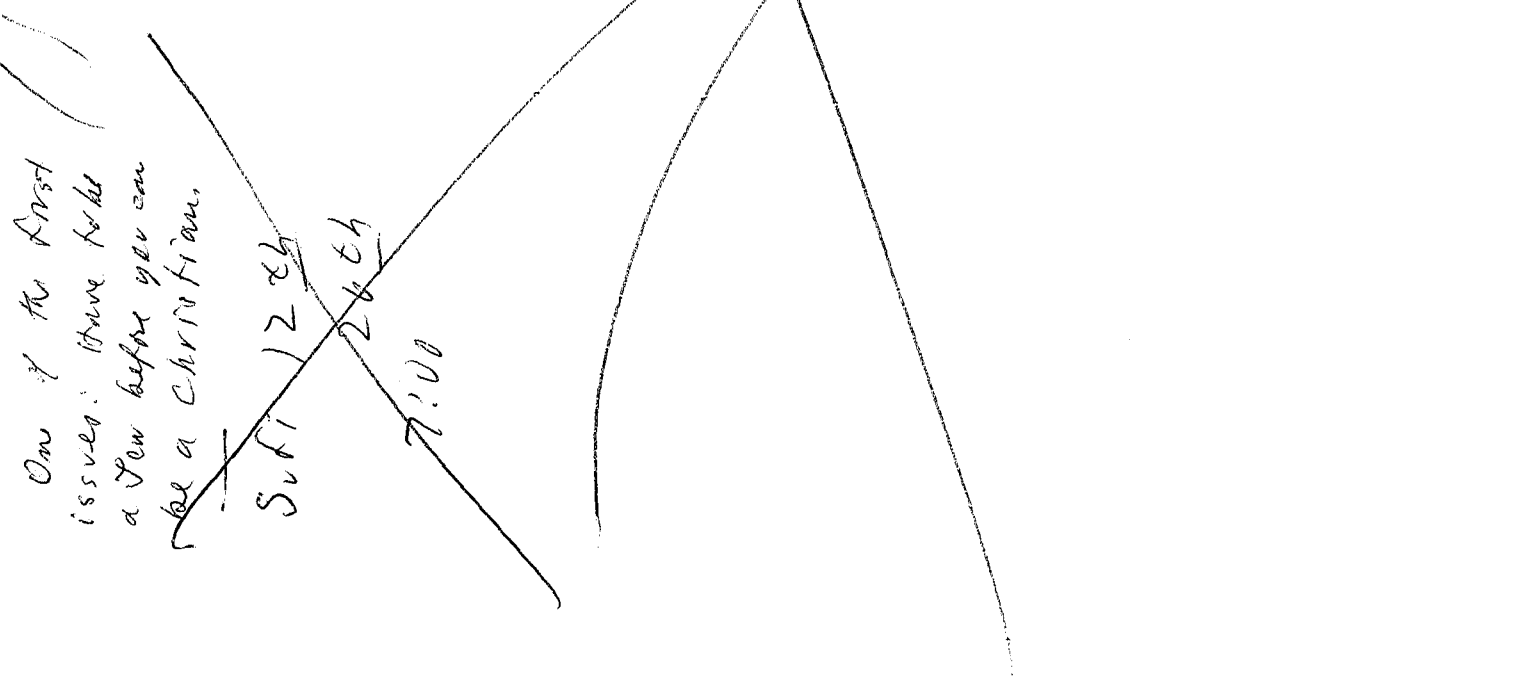
repeat
iterate
recursion
departure + return

Call Sign: WPG 10/22/94

Penrose - Shadows of the Mind

Fuller: Critical Path

Frank Tipler: Physics of Immortality



SGNFCTN.P51 DISK:SIGNIFICATION

SIGNIFICATION

Signification is the process of selecting the essential or salient with respect to a specified domain, goal, or value.

DOMAIN	SIGNIFICATOR	SCIENCE
Individual	Interest	Psychology
Society	Importance	Sociology
Culture	Validity	Ontology
Universe	Truth	Cosmography

For each value of the domain parameter, the significator ranges over a second parameter which has to do with the following values:

The information content.
This is usually manifested by the unusual or unexpected, the out of the ordinary, the novel, the revolutionary, the non-traditional, as the positing of a novel alternative or new way of doing something. (e.g. The ideas of Copernicus) High information content is associated with the unanticipated, the novel, what the media think of as NEWS.

The extent of the ramifications.
Those items which promise applicability to many fields, or whose inferences in one or more fields are far-reaching. (e.g. the calculus) Life span itself is a measure of ramification, hence what promises to be of long duration possesses this value.

The level of vitality.
Items which inspire or energize. They need be neither new nor old, but capable of rousing devotion, commitment and sacrifice.

Market research.
Market research, what is in current demand, is used to significate. Its usefulness is based on the inertia of public thinking and acting and on the universal shortness of memory.

General signification hinges on the above three criteria, but specific signification may be the interpretation of the above in terms of a specified goal, purpose or direction.

Most of what appears in the media is significated in terms of the prolonging of the life of moribund ideas and institutions. It involves the great costs required to keep active the life-support

systems supporting comatose and obsolete systems from final demise.

Notes on Signification

Frequently the most significant occurence may be highly invisible or apparent only to those trained to significate. We have the example of the birth of the Christ Child occuring not in a palace but in a stable. Only the Magi, of all mankind, were able to significate the event, which they were able to do because they could perceive the Star. To significate is thus to perceive the Star.

The reason for the invisibility is to protect the child, the innovation, from the Herods. There are two archetypes involved: Cronus either devours his children or the Olympians overcome and destroy the Titans.

What are examples of the fourth domain?
Do the archetypes belong in the 4th domain?
Perhaps the changing and mortality of the figure and the necessity for a permanent and unchanging ground belong to the fourth domain.

Juxtapositions:
Interest vav Entertainment
Education vav Entertainment
Information vav Signification

Active vs. Passive Signification.
Active signification influences the future.
Passive signification mirrors the past (cf. market research)
However, just mirroring also leads to influence.

SIGNIFICATION AND INFORMATION APHORISMS

- Signification is required when there is understructuring of experience.

- The necessity for signification arises in an environment of abundance or over abundance, for in such environments the best and most useful can be easily overlooked.

- Advertizing is a signification industry.

- In the post industrial age the problem is no longer how to produce, but what to produce.

- In an environment of scarcity everything has been significated and even fought over.

- Signification is required because of the limits to the information processing power of the human mind.

- Reality is a signification of the hills and valleys of experience.

- **The Law of Information Exchange**
  The one who knows the mosts learns the most from any exchange.
  The information rich get richer faster than the information poor.
  The richer one's codebook, the more the information that can be gleaned from any message.

- The greatest truths are not hidden. They are everywhere, but only one who can significate can find them.

- Those with no skill in signification, become addicted to authorities.

- You must live by dogma until you can significate.

- The meaning is not in the message, it is in the codebook.

- "It is easier to measure a quantity than to find out whether it has been previously measured and if so what the result was."

  Harrison Brown

- Signification in science is not so much problem oriented as product oriented. That is, research selections are based not on the intrinsic significance of the problem but on the probability of success in solving it.

- The veritable discoverer is not the one who finds something new, but the one who first sees the significance of it.
  Max Verworn

- Importance is what is interesting to the significator. LK

- The significator is to information what the chairman is to management.

- The media, the institution charged with signification, can't and doesn't.

- Knowledge is significated experience, Wisdom is significated knowledge. LK

- Knowledge may often, but wisdom may never, be secularized.

- Something may be ubiquitous and important but unrecognized until a word is given for it. Naming brings into consciousness.
  "I always thought morphologically, but never knew it until Zwicky gave it a name"
  - Feynman

Transfer to Significance

SGNFCTN.WP5

SISK ~~EDSEA CONTROL~~ SIGNIFICATION

SIGNIFICATION

Relevance (e.g. the Gulf)

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DOMAIN		SIGNIFICATOR	SCIENCE
Individual	Current resolution on all levels	Interest	Psychology
Society		Importance	Sociology
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Significance and Futurism

value to user i.e. significance is a step in the transformation of data into information

The extent of the ramifications. RELEVANCE
Those items which promise applicability to many fields, or whose inferences in one or more fields are far-reaching. (e.g. the calculus) Life span itself is a measure of ramification, hence what promises to be of long duration possesses this value.
HIGH IMPACT FUTURE

Significance re Relevance Relevance to "—"

CANONS FOR JOURNALISTIC SIGNIFICATION: WHAT IS NEWS

The level of vitality.
Items which inspire or energize. They need be neither new nor old, but capable of rousing devotion, commitment and sacrifice. PRIMORDIAL

Market research.
Market research, what is in current demand, is used to significate. Its usefulness is based on the inertia of public thinking and acting and on the universal shortness of memory. past oriented — others future oriented

General signification hinges on the above three criteria, but specific signification may be the interpretation of the above in terms of a specified goal, purpose or direction.

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over

Notes on Signification

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What we talk about
depends on the sort of play or audience
Shall. Mutual Interest
Club General Interest
Media Entertainment

SIGNIFICATION

INFSGN.WS4 DISK: ~~PROJ72~~ 04/01/87

ON SIGNIFICATION IN INFORMATION

GOTH9

"People don't want more informatio
they want the right information at the right time"
Chris Yal

Putting new wine in old wineskins is always fraught with the danger of losing the new wine. But there is also danger of losing good old wine if the old wineskins are uncritically discarded. Both of these dangers are present when a new meaning is adopted for an old word. The word **information** has been around for many centuries and has acquired many meanings. A few decades ago when scientists and engineers picked this word to represent a new concept that had evolved, they felt that at last they had given information its basic meaning and that henceforth all other technical uses of the term could be abandoned. But there remained too many other important uses of the word, technical and everyday, for the term *information* to settle exclusively into its latest assigned meaning. This has resulted in the confused usage that continues to derail everyone including those who sought to rigorously define it.

The problem with information is more than one of semantic confusion. It is known that information in the sense of "news" is related to the concept invented in the 19th century by physicists which they called "entropy". But, as the famous mathematician John von Neumann once joked, "Since no one knows what entropy is, use the term. You will always have an advantage in any discussion." The fact is, no joke, that no one does know what entropy is. It is a concept and a term that is still searching for its real identity. And information as related to entropy is still searching for its full identity. But the word information is used for more than negentropy or just "news". The telephone directory contains information, a street sign contains information, Gibbon's "Decline and Fall of the Roman Empire" contains information, floppy disks used in personal computers contain information. None of this breed of information fits the technical definition that the amount of information is measured by its level of unexpectedness, which is to say by its news content. Contrary to the technical definition, we rightfully persist in saying that software is information, databases are information, and libraries are full of information. The semantic aspects of the problem could perhaps be resolved if we would agree to call software, databases and libraries <u>data</u> instead of information, and let the purists reserve the term information for that data which surprises us and temporarily dehomogenizes us.

However, deeper problems remain having to do with some of the properties of information. One property of information (not data) that confuses us is that it destroys itself the more it is communicated. A second bothersome property is that as the abundance of information increases our ability to make use of it decreases. Physicists will immediately recognize here the presence of their law of laws--the Second Law of Thermodynamics.

SGNFCTN.WP5

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CONCEPT1.WP5 DISK:IDEACONTROL Ø8/Ø4/89

SIGNIFICANT CONCEPTUAL AREAS

TRANS-ARISTOTELEAN LOGIC VERTICAL AND HORIZONTAL LOGICS	G. SPENCER BROWN
CALCULUS OF DISCONTINUITY SPECIES OF DISCONTINUITES "CATASTROPHY THEORY"	RENE THOM
SPECIES OF NOISE STOCHASTIC PROCESSES inc Stochastic Resonance POWER SPECTRA AUTO CORRELATIONS	NORBERT WEINER et al
NON-EQUILIBRIUM THERMODYNAMICS	ILYA PRIGOGINE
CELLULAR AUTOMATA	JOHN VON NEUMANN
FRACTALS	BENOIT MANDELBROT
NON-LINEAR DYNAMICS CHAOS THEORY ALGORITHMICS ATTRACTORS	EDWARD LORENZ et al
HIERARCHY THEORY	LANCELOT WHYTE et al
MORPHOLOGICAL CONSTRUCTION	FRITZ ZWICKY
NON-VIOLENCE	M. K. GANDHI
CYBERNETICS	NORBERT WIENER et al
PERSPECTIVISM COMPLEMENTARITY - With Bohr FACETISM - Agwilson MULTI-VALENCY - Jenck	LUDWIG VON BERTALANFFY
QUANTUM REALITY	NIELS BOHR et al
SELF-REFERENCE SELF-SIMILARITY	DOUGLAS HOFSTADTER
THE ANTHROPIC PRINCIPLE	JOHN BARLOW et al
AUTOPOESIS	FRANSISCO VARELA
SPARSE DISTRIBUTED MEMORY	PENTTI KANERVA
FEYNMAN PROBABILITY	RICHARD FEYNMAN

STOCHASTIC RESONANCE SN Feb 23, 91 p127

INFORMATION as PHYSICS INFRASTRUCTURE WHEELER
The IT from BIT

CONCEPT1.WP5 DISK:IDEACONTROL Ø8/Ø4/89

SIGNIFICANT CONCEPTUAL AREAS

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CALCULUS OF DISCONTINUITY SPECIES OF DISCONTINUITES "CATASTROPHY THEORY"	RENE THOM
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CONCEPTUAL FRONTIERS

ALTERED STATES OF CONSCIOUSNESS...	PSYC
APPROPRIATE TECHNOLOGY.....	ECON
ARTIFICIAL INTELLIGENCE.....	TECH
BELL'S THEOREM.....	PHYS
BLACK HOLES.....	ASTR
CATASTROPHE THEORY.....	MATH
CIRCADIAN RHYTHMS.....	BIOL
CONPLEXITY THEORY.....	MATH
CRETACEOUS/TERTIARY LAYER.....	GEOL
DISSIPATIVE SYSTEMS.....	PHYS
EARTHQUAKE PREDICTION.....	GEOL
EKISTICS.....	TECH
ESP.....	PSYC
FRACTALS.....	MATH
FUTURES RESEARCH.....	SOCY
FUZZY SETS.....	MATH
GAME THEORY.....	MATH
GENERAL SYSTEMS THEORY.....	EPIS
GRAVITATIONAL LENSES.....	ASTR
GRAVITY WAVES.....	PHYS
GREENHOUSE EFFECT.....	METR
HOLOGRAPHY.....	TECH
INSTANTONS.....	PHYS
INTERSTELLAR MOLECULES.....	ASTR
LASERS.....	TECH
LAWS OF FORM.....	MATH
L5.....	TECH
LIFE AFTER LIFE.....	MEDN
MICROCIRCUITS.....	TECH
PLATE TECTONICS.....	GEOL
PULSARS.....	ASTR
QUANTUM CHROMODYNAMICS.....	PHYS
QUASARS.....	ASTR
RIGHT LOBE/LEFT LOBE.....	MEDN
RANDOM NUMBER OMEGA.....	MATH
RECOMBINANT DNA.....	BIOL
SETI/CETI.....	ASTR
SOCIOBIOLOGY.....	SOCY
SOLITONS.....	PHYS
STRUCTURALISM.....	PSYC
TECHNOLOGY ASSESSMENT.....	ECON
ALTERNATE ACCOUNTING SYSTEMS.....	ECON

GOLDLIST.DOC

THE GOLDEN LIST

We shall not make it until we all make it.

All suffering (SIN / loneliness) is isolation from God.

The injunctive is the antecedent of the indicative.

Epistemology establishes ontology and ontology shapes epistemology.

Form is primary.

Chaos proliferates chaos and order proliferates order.

Hierarchies are (either) self-referential or modular.

A coin may stand on edge.

Patterns in time:
- Departure and return
- diffusion and focus
- transformation and exploration
- potentiality and realization

Discriminations:
- Metastates and alternate states
- node and link
- logic and level
- (BOX AND CONTENT / CELL AND NUCLEUS)

In the beginning was the Word.

In the beginning Siva danced.

In the beginning the Ainu sang.

Our thoughts shape the future.

Do not answer a question that has not yet been asked.

REALITY IS DEFINED BY THE QUESTIONS WE PUT TO IT. (determine) — John Archibald Wheeler

ULTQUEST.DOC

SOME OF THE ULTIMATE QUESTIONS

o Does the universe make sense in terms of human capacity to comprehend?

o What is the good life?

o Where are we? Where are we going?

o What is man that Thou art mindful of him? Psalm 8

o What is the cause of the universe? The Upanishads

o Whence do we come?

o Why do we live?

o Where shall we at last find rest?

o Under whose command are we bound by the law of happiness and its opposite?

o Is this our only life? Do we live again?

IN SUMMARY

o What is it all about?

o What can I do about it?

SIGNIFICANT TECHNOLOGICAL AREAS

Computers

Lasers

Fiber optics

Drug research

Recombinant DNA

Space

Ageing

Miniaturization

Fusion

Artificial photosynthesis

Superconductivity

Cold Fusion?

What is the impact of each on:

- Elitism
- Centralization
- Ecology
- Option space

Consciousness / Self Reference

61 Cygni / Global Output

GENERAL MORPHOLOGY

Albert Wilson

- INTRODUCTION TO MORPHOLOGY
  - What is morphology, its goals, its applications
  - Morphology in history and the History of morphology
    Its successes, its repeated rediscovery
  - Some epistemological aspects of morphology
  - Relation of morphology to other methodologies
    operations research, general systems theory, etc.
- MORPHOLOGICAL CONSTRUCTION
  - Techniques for exploration and discovery: The Search for Totality
    - Systematic field coverage
    - The morphological box
    - Morphological spaces
    - Method of extremes
  - Techniques for invention and research: The Generation of Alternatives
    - Variations of conditions
      - Negation and reconstruction, Variation of the axioms
      - Inversion, variation of roles
      - Variation of initial and boundary conditions
      - Variation of the scope of the problem
    - Transfer, analogy and homology
    - Modest morphology, morphological boxes again
- EXAMPLES OF MORPHOLOGICAL MATRICES
  - Worldviews
  - Models of teaching
  - Conflict resolution
  - Population control
  - Food
- References and bibliography

GENERAL MORPHOLOGY

Albert Wilson

INTRODUCTION

The term 'morphology' has long been used by biologiest and geologists to designate those branches of their subjects that relate respectively to the forms of bio-organisms or the forms of geo-structures. Morphology has also been used to designate the study of form in its most general aspects by philosophers, semanticists, artists, etc. Indeed, morphology can be a branch of almost any discipline. Just prior to World War II the astrophysicist, Fritz Zwicky, adopted the term morphology to designate a systematic way of thinking that he had formulated for the discovery of alternative possibilities -- alternative solutions, alternative policies, alternative approaches, alternative opportunities, etc. The sets of rubrics for the systematic development of alternatives that were first formalized by Zwicky and later extended by others have acquired such labels as: Morphological Thinking, Morphological construction, Morphological outlook, the Morphological Method, or most commonly, just Morphology. The last adds heavily to an already over-burdened term, but as with most appelations, whatever the advantages or disadvantages, usage becomes the final arbiter. To invite or warn off the expectations of the reader, the subject of the present paper will be limited to morphology in the sense employed by Zwicky, but as will be seen this is not very limiting.

If morphology has indeed fulfilled its claim of having developed successful techniques for the discovery or invention of alternatives, we may justifiably ask whether the generation of alternatives per se is worth whatever

expenditure of time, energy, or funds it entails. Decisions between or among alternatives are themselves time, energy and fund consuming. Why should we bother to complicate the decision process further when it is already so complex that systematic decision making has become of necessity one of the central disciplines in graduate schools of business and management. If we are trying to smooth and expedite decision making -- a converging process -- how can the development of additional, and perhaps extraneous and irrelevant options -- a diverging process -- do more than add to the problems of decision analysis that are already sever enough. In short, who needs more alternatives and for what? Besides, the world is filled with people having a mind-set that once they discover there is something additional that can be done, they immediately set upon trying to do it. To spread a richer smorgasboard before these people will only result in more and more unneeded projects competing for diminishing resources. Thus to generate additional alternatives is even to create a threat.

The morphologist will readily agree with those who raise these objections. They are valid questions to ask from the vantage point of a worldview that holds the only thing to do with alternatives is to pick one as quickly as possible so as not to have to sustain the tensions that derive from ambiguity; a worldview that subscribes to Ozbekhan's Law, "Can demands do;" a worldview whose primary evaluation of knowledge is in terms of its implementability. But the morephologist, early in his study of morphology, recognizes that the practice of morphology runs counter to such a worldview. He comes to see that morphology is really much more than a set of rubrics for the generation of alternatives, it involves the adoption of an entirely different worldview. One of the reasons that many people have difficulty in applying the morpholigical method is that they are unable to switch their vantage point

and look on their activities and goals in a different light. Morphology is a tool that can be used only by those who adopt the morphological outlook or morphological worldview. It is a frame of mind as much as it is a methodology. Before describing, then, the various techniques of morphological construction, we meed to understand the tenets of the morphological worldview.

THE MORPHOLOGICAL WORLDVIEW

"Maturity is the ability to accept
and deal with ambiguity." Freud

The morphological worldview is predicated on the belief that the number of options open to us is a form of wealth. Hence the size of our 'option space' is a measure not only of our freedom, but a measure of our potentialities and the richness of our future. If then humanity's option space is one of its most precious resources, it follows that we should pursue those activities and actions that lead to the augmentation of our spectrums of choice and avoid those that diminish or destroy our option space. As our option space shrinks, the future passes from our hands into the maws of determinism until, with a zero option space, we have the same freedom as a ball rolling down an inclined plane or a bullet fired from a gun. We are reduced from a human to a mechanical level. We need only to review the events in Europe in the summer of 1914 to impress ourselves with how step by step those in charge in Austria, Russia, Germany, France, and Britian made decisions that reduced their own and their opponents option spaces until the course of events was taken over by a clock-like determinism that lead inescapably and irrevocably to the tragic climax. Today, the destruction of our mutual option spaces would result in our mutual destructions.

The task of the morphologist is to serve the value of a maximized option space through the generation of as many alternatives as possible. The task of the decision maker is to serve this value by including as a most important input in every decision its effect on the size of his subsequent option spaces.

But the morphological worldview does not value alternatives solely for their contribution to the size of an option space. Alternatives have value in themselves whether or not they are ever used as inputs to a decision process. Alternative solutions to a problem, for example, serve as nodes in a relational structure whose gestalt perception gives us deeper insights into the nature of the problem. The more alternatives we possess, the better can be our understanding of the structure. From a set of alternatives we can discover the parameters that relate them to one another and from these parameters and the values they assume in the specific alternatives already in our possession we can, by supplying different values, extrapolate to hitherto unknown solutions of the problem. The new solutions may reveal new parameters or lead us to a more meaningful re-parameterization of our known set of solutions. This type of extrapolation may be repeatedly iterated for the purpose of acquiring the totality of solutions to the problem.

The pursuit of totality is thus seen to be an important characteristic of the morphological worldview. It involves more than the ordinary collectors' syndrome applied to approaches, viewpoints and solutions instead of to stamps, Picassos and corporations. In the pursuit of totality, the morphologist recognizes that knowledge at its best is imperfect and in possessing many views, approaches or solutions he develops a "stereoscopic vision" that

enables him to perceive what is usually missed when we are restricted to a single view or approach. It does not matter that the diffferent views or approaches appear to be inconsistent or contradictory for all contain some reflection or shadow of the whole. "The Truth" may never be known or knowable but the integration of the totality of views and approaches gives a far better approximation than given by any particular single view or approach. A four dimensional figure, for example, cannot be truly represented in 3-space. Many representations, according to different projections, are possible, but there is no such thing as the correct projection. All may be correct, but none is identical with the original figure. The three blind men in the fable of the elephant would have been able to obtain a fairly good description of the elephant had they integrated their respective results instead of arguing who was right. History is replete with the arguments, persecutions and wars arising over which view, theory or belief is correct. The morphologist would have the energies which have been devoted in the past to the question of which, devoted in the future to the generation of all. The morphological worldview seeks to avoid having beliefs, theories and viewpoints become dogmas, but prefers to regard them as tools and experiments for the development of additional alternatives and further insights. All of this sounds quite acceptable and even tautologically platitudinous to one side of our brain, but runs into difficulty with the other side for it is not easy to opt for postponement of judgement and the tensions of ambiguity and unresolved choice.

Morph.
4-9-76

GENERAL MORPHOLOGY

Introduction

In the early nineteenthirties Dr. F. Zwicky of CALTECH and the Mount Wilson and Palomar observatories developed a philosophy of total research that was to be known as General Morphology, or, more precisely, as the Morphological Method of Thought and Procedure. It should be emphasized at the outset that Morphology, as understood and practiced by Zwicky and his collaborators, is not a science, but an elaborate system of organized common sense that can be applied to all areas of human endeavor. To the dedicated practitioner morphology constitutes a way of life, a basic philosophy, that will never permit him to indulge in narrow-minded considerations of single issues or standpoints. Accordingly, the morphologist always strives for the totality of all possible solutions of a given problem and is not satisfied with just a few, picked at random or under the influence of tradition and prejudice. It is apparent, therefore, that General Morphology demands above all else a completely unbiased approach to all problems. It deliberately excludes all external value systems from consideration until the set of all possible solutions for the given problem has been established. The external value system will, of course, play the decisive role in the selection of the best possible solution from this set, since different value systems will normally lead to different selections.

Any procedure which conforms to the aforementioned philosophical principles may be perceived as a part of the general morphological system. It is advantageous, however, to single out some of the more productive of these procedures as particularly characteristic examples and to visualize General Morphology as consisting of a number of distinct Morphological Methods:

1. Dimensionless Morphology, which is based entirely on the ability to distinguish and count a given set of objects.

2. The Method of Field Coverage, which starts from a few pages of knowledge within a certain field and attempts to cover the entire field by systematically adding new bits of information and by increasing the range of validity of the given pegs.

3. The Method of Negative and Subsequent Construction, which systematically explores the possibilities arising from the replacement of existing paradigms by other assumptions contradictory to the same.

4. The Method of the Extremes, which systematically pushes the range of validity of established theories to the ultimate limits, thus either extending that range or finding a contradiction leading to a new and better theory.

5. The Method of Dualism, which attempts to find new fields of application for a theory established in another field.

6. The Method of the Morphological Box, which serves as a means to assure that the totality of all possible solutions for a given problem, as characterized by a set of comprehensive and essential parameters, has been outlined and that nothing of importance has been overlooked.

As will be amply documented in the following paragraphs, all these morphological methods have been extensively used by some of the great creative minds in the history of human civilization. It is a remarkable fact, however, that in most cases the authors seem to have taken great pains to conceal the way by which they arrived at their results or discoveries. Evidently, the morphological approach was always held in great esteem, but it was treated as some sort of professional secret, not to be disclosed in public. To what extent this practice may have hampered progress is impossible to ascertain, but it certainly added significantly to the personal reputation of the practitioners.

René Descartes could be considered as having anticipated the morphological principles in his famous "Discours sur la methode," published in 1639, were it not for the unfortunate fact that this publication was completely overshadowed, in the eyes of posterity, by the one outstanding example given therein to illustrate the Method: The invention of Analytic Geometry.

The great instigators of scientific revolutions, such as Copernicus and Kepler in Astronomy, Galileo, Newton and Einstein in Physics, Darwin in Biology and Wegener in Geology are highly praised for the courage with which they dared to oppose well entrenched dogmas and beliefs. Their behavior is recognized by most historians as an outgrowth of true genius while the morphologist recognizes and admires it as a manifestation of their strict adherence to basic morphological principles. It is somewhat surprising, therefore, that nobody saw fit to integrate those principles into a coherent system or philosophy, until F. Zwicky undertook to accomplish this task. To him must go the credit for establishing General Morphology as a most powerful tool for discovery, invention and total research.

F. Zwicky used Morphology extensively in his own investigations which encompassed such diverse subjects as Astronomy, Jet propulsion, World order, Energy conversions, the teaching of languages, and Education. Most of his researches, however, are of a highly technical nature and not easily comprehensible to the non-expert. Nevertheless, his writings include a number of books and pamphlets wherein he presents the morphological system to the general reader in an intellectually stimulating way. These publications will have to serve as the sole base for future historians because, unfortunately, Zwicky's plans for a comprehensive textbook on the subject were never realized.

The attached Bibliography includes only a selection of Zwicky's publications, namely those books and articles which deal directly with the Morphological Method and its applications, and no claim is made as to its completeness. Indeed, Zwicky's entire life work is permeated by the morphological spirit and stands as a monument to the power of the Method.

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MORPHOLOGY AND MODULARITY

A. G. WILSON
Douglas Advanced Research Laboratories
Huntington Beach, California

The morphological approach is not only a methodology for solving problems, it is an attitude toward problems. It is an attitude that demands that no problem be considered in isolation of all relevant contexts. It is an attitude that would try to take off our customary blinders before looking at the problem. It tries to obtain an unfiltered view by comparing views through as many different filters as possible. It looks for all possible solutions by also looking at many of the impossible ones. It attempts fresh views of the problem by looking at similar problems. In short, the morphological approach uses whatever methodologies are available to arrive at the most complete and unbiased representation of the structure of the problem and its solutions as is possible.

This attitude will be recognized as basic not only to the morphological method but to some of the other methodologies described in this symposium. In order that ground previously covered not be repeated, this paper will restrict discussion to examples of two important methodological procedures not hitherto considered. The first of these is an exercise toward the development of useful non-mathematical modeling. The second is an example of

From: New Methods of Thought and Procedure, Springer-Verlag, N.Y. 1967, Zwicky, Wilson editors

hypothesis generation through morphological analogy.

I. NON-QUANTIFIED MODELS

One of the extensions of problem solving capability needed for many important problems today is the development of methodologies for handling problems not easily quantified.

It frequently happens that many of the parameters that we know have relevance to a problem are not readily amenable to measurement or quantification. There is a tendency to concentrate on those parameters for which numerical values are obtainable and to neglect those parameters which are not measurable even though their relative weight in the problem may be high. To offset this tendency a methodology is required by which we are somehow able to incorporate the effects of those parameters which cannot be quantifiably represented. Examples are esthetic, ethical and moral values, psychological factors, and unquantifiable requirements of the future.

When standard numerical methodologies fail, or when non-quantifiable factors must be taken into account, a relevance type morphological procedure proposed by Alexander and Manheim may be applicable. The idea is based on the predication that any form or structure may be thought of as resulting from the interaction of a set of abstract forces or tendencies. These are general, not merely physical, forces. They may be quantifiable or unquantifiable, with no restriction on their variety. The totality of these forces generates a solution that reflects the contribution of each. The problem is to find a representation of the forces that allows them to be combined. Said in another way the problem is posed in an abstract space in which the representative elements are the generalized forces. The aggregate of such elements defines a form. If the aggregate is complete and in balance, the form becomes a stable object or solution.

A concrete example of this approach attempted by Alexander and Manheim may be found in the MIT report entitled, "The Use of Diagrams in Highway Route Location." Alexander and Manheim's problem was to locate the route for a freeway covering a 20 mile stretch in Massachusetts starting at Springfield and ending somewhere near Northhampton. They first morphologically derived all of the individual abstract forces whose interaction would determine the path which the freeway should take. Shown on Table 1 of the freeway design parameters, is the goal or objective of the study, which was a freeway to meet major current traffic desires. In this case the aggregate solution was restricted to be a new freeway, rather than a morphological examination of all possible solutions to meet current traffic requirements. This new freeway had to be considered in the context of its interaction with existing freeway systems and in support of the competition with other transportation systems. Future transportation systems as visualized also had to be given representation. However, the largest number of constituent forces fall into two classes; those which determine the internal structure and behavior of the freeway, and those reflecting the interaction of the freeway with the environment. Table 2 of freeway design parameters shows the decomposition of the internal and environmental parameters into their different values. Under internal parameters, are first the construction parameters including earthwork costs, bridge costs, pavement and subgrade costs, and construction interference. Secondly, there are economic factors: land costs, public financial losses, user costs, obsolescence; and thirdly, operational factors: travel time, local accessability, safety, maintenance, and self-induced congestion.

The environmental parameters may be divided into physical, economic and esthetic. The physical environment includes questions of drainage patterns and catchment areas, effects of weather, air pollution. The economic environmental factors include the effect of the freeway on regional and local land development, public and private losses, such as the obliteration of historical, commercial, or other structures due to the routing of the freeway. Finally, esthetic considerations such as eyesores and noise must be considered.

Certainly not all of these parameters are easily measured, nor is it even possible to assign numerical values to some of them. Alexander and Manheim developed a method by which each factor would be reflected in the overall selection of the freeway route. They employed a modification of the method Zwicky has termed composite analytical photography. Each of the modular forces listed on the charts by itself favors a particular location for the highway. For example, consider earth work costs. The requirement to minimize earth work favors the location of the freeway in areas where the land is relatively flat. A transparent map is made in which the flat portions are rendered dark and the hilly portions light, the degree of hilliness and flatness can be represented by a corresponding density or opacity on the map.

Thus the tendency or force to locate the freeway in accordance with the minimization of earth work costs is to put the path in regions of maximum density on the map. Similarly for each of the other forces. If a separate transparent map of each of the forces which contributes to the location of the freeway is made so that the dark area favors location and the light area rejects location; if the forces are then combined through the process of composite photography, the resulting density on the photograph made from superimposing all the individual photographs would give the location that all the forces in combination tend to favor. The darkest strip would mark the best route.

By using this method, those parameters or forces which cannot be quantified can be weighted either through the density used on their representative maps or through the way in which the maps are superimposed. A subset of three or four parameters given equal weight and densities can be combined to produce a composite density which might then be reduced in order to adjust the joint weight of the set before combining with the maps of other parameters or sets. The structuring of the combinations thus provides the ability to weight the various factors.

II. MORPHOLOGICAL ANALOGY

a) Artifical and Natural Systems

An interesting emergent property of recent times is that the source of new concepts and basic scientific knowledge is not only the natural order but also the structures and organizations created by man. The collection of concepts which are called "cybernetics" were derived jointly from the study of animal nervous systems and man-made control systems. The idea of information came from the study of special communication networks but merged with the concept of entropy. Today the important basic concepts underlying structure and organization are being brought to light by the designer of complex systems as well as by the observer of the natural order. In the sense of discovery vis-a-vis application the historic distinction between science and technology is thus tending to disappear.

As a result of the abstract parallelisms between natural and artifical systems we are able to create objects for study which provide us with the equivalent of new views of the natural order with temporal and spatial resolving powers hitherto unavailable. For example, the freeway provides us with a new type of fluid, called traffic, whose properties can be made useful to us in developing more comprehensive theories of fluid dynamics, extending to new realms the laws of fluids as observed in nature. The growing sample of such structures and organizations which have been made available for study as a result of our own creations provides still another positive feedback contributing to the accelerated development of science and technology. In effect we are creating another powerful epistemological methodology simply through constructing and studying systems that occupy some of the gaps in the natural order. (Even the reasons for the natural gaps may be learned in time if our creations prove unstable.)

b) Hierarchical Modular Structures

One possible source of information on systems of

complex structures is in the analysis of how complexity and bigness are treated in the natural order. We observe throughout nature that the large and complex is constructed in a hierarchical modular manner from the small and simple. Direct confrontation of the large and small is avoided, a hierarchical linkage is always interposed. Bigness is avoided in the sense that the ratio between the size of any structure and the modules out of which it is built is functionally bounded. If there are demands for a structure to continue to grow in size or complexity, then a new level in the hierarchy and a new module are introduced so that aggregate to module ratios may remain bounded.

Formally, by a hierarchical modular structure we shall mean an aggregate or organization of modules that are in turn hierarchical modular structures. Such a structure may be closed in the sense that there is ultimately a lowest level whose modules are not decomposable. Examples of hierarchical modular structures are ubiquitous: in the macrocosmos, there is the grouping of stars into galaxies, galaxies into clusters, etc.; in the microcosmos, the grouping of atoms into molecules, molecules into crystals, etc.; in the mesocosmos, there are the organizations and structures of man, armies, hospitals and hierarchical coding models.

What can we learn through comparing the properties of these hierarchical modular structures, artificial and natural, that will be useful in deriving a syntax to structure and increasingly complex systems of today's world, or that will be useful in understanding the limitations of our own organizations and structures? As an example of the method of morphological comparison we propose to look at two hierarchical systems--one social, one physical.

Martin Ernst's paper in this volume on city planning from the operations research point of view discusses the modular parameters basic to urban structure and evolution. The paper elaborates on one model, affording techniques through which planners and city officials could control the

direction of changes in an urban complex. Ernst's approach might be called a reductionist approach, decomposing the city into components and sub-components, and looking at the "portfolio of possibilities." This is an important part of the analysis of any complex problem. However, the morphologist wants to add something. There may exist some parameters which place limits on the portfolio of possibilities but which are not evident in the reductionist approach. I would like to look at the city in this alternate manner. For this purpose the important properties of hierarchical modular structures to abstract are the bounds or limits to which the modules and the aggregates may be subject.

There are indications that our cities may be approaching some kind of critical limits. What kind of limits might these be, and how may we avoid difficulties without having to test to destruction to see where the failure occurs? To do this, let us compile sufficient modular forces to close the form we call a city, and see what the limitations on that form might be.

First, human beings as modules are subject to aggregating forces as are other so-called social creatures. These forces tend to draw people into physically compact aggregates. Historically, humans aggregated into towns and walled cities for trade and physical security. Today natural gregariousness is still very much a force bringing men together for physical, economic, and emotional security and growth.

Next, there are density limits governing how closely people may satisfactorily live together. These limits depend on the amount of freedom of movement and privacy we require. The higher densities in prisons and concentration camps are possible because of the restriction of movement and loss of privacy. Without knowing the value of the density limit, we can definitely assert that such a limit exists. (If you want an absolute limit, you may take the value of one person per 1.83 sq. ft., provided by Surajah Dowlah's experiment in close packing of humans

in Calcutta in 1756.) However, we must bear in mind that in the modern city for purposes of density limits, the real inhabitants are motor vehicles, not people. The maximum density is determined by the minimum space needed for maneuvering, parking, and servicing automobiles.

A second limit exists in city life. This is the limit on the time required to be in movement to transact the city's business, or the bound on the maximum fraction of the day that the average commuter can tolerate spending in commuting. Doxiadis' studies show in cities of the past, the maximum distance from their centers was ten minutes by walking. We have certainly moved a long way from this value toward the commuting time limit. Three hours, or one-eighth of the day is not uncommon although the average is still considerably less than one hour per day. Both the city and the human modules which come together to make it are governed by the characteristic time period of 24 hours. This is an "absolute" value that is not at our disposal appreciably to modify. It is more basic than the day-night cycle imposed by the earth's rotation since this period is also set by the biological clock in each inhabitant. Even though adjustments in basic commuting problems can be made by some people, such as going to work on Monday, living near their work, and returning home on Friday for the week end, such practices can not alter the basic 24-hour period set by the needs of the city and its population. With present work and sleep requirements commuting time must be no greater than 1/3 of 24 hours.

These limits may readily be combined symbolically to define a closed entity. Let $\hat{\sigma}$ be the density bound and $\hat{\tau}$ the commuting time bound. (The latter may be expressed in terms of the natural period of the city $T = 24^h$ by $\hat{\tau} \leq \zeta T$ where $\zeta < 1.$) For a simplified model of a two dimensional city, $N = a\bar{\sigma}R^2$ where R is the maximum length path through the city and a is a shape factor. A limiting velocity which depends on the state of the art will be designated by c. The realizable commuting velocity will be less than c.

Since $R \leq c\bar{\tau} \leq c\hat{\tau}$ and $\bar{\sigma} < \hat{\sigma}$, where barred quantities are mean values, we have $N = a\bar{\sigma}R^2 < ac^2\bar{\sigma}\bar{\tau}^2 < ac^2\hat{\sigma}\hat{\tau}^2 \leq ac^2\hat{\sigma}\zeta^2T^2$. In a three dimensional model we may introduce the mean height, $\bar{h}$, of the city and use three dimensional densities, $\bar{\rho}$ and $\hat{\rho}$, giving

$$N < a'c^2\bar{h}\hat{\rho}\hat{\tau}^2$$

If we designate the absolute limit $\hat{\rho}\hat{\tau}^2$ by $1/H$, then

$$\frac{HN}{c^2\bar{h}} < a' \qquad (1)$$

These particular limits combined with an aggregating force may indeed have some significance with regard to cities, for it is interesting that a similar relation obtains in cosmic aggregates.

In 1907 before the development of modern cosmological theories and before the establishment of the existence of white nebulae as external galaxies, the Swedish mathematician C. V. L. Charlier showed that in a universe containing an infinite number of stars the sum of gravitational forces acting at every point would still be finite provided the universe were structured in a hierarchical modular manner. Quite independently of possible relevance to cosmology, Charlier's inequalities showed in general that a hierarchical modular structure could be used to bound density and inverse square type forces.

Under assumptions of uniform density and spherical symmetry, Schwarzschild showed that the field equations of general relativity predicted the existence of a bound on the gravitational potential

$$\frac{GM}{c^2R} \leq \frac{1}{2} \qquad (2)$$

where M is the mass and R the radius of the gravitating sphere. Under the assumption of uniform density this limit demands the existence of hierarchical modular structure. If the equation is written in the form

$$\bar{\rho}R^2 \leq B$$

where $\bar{\rho}$ is the density and B is a fixed bound (we assume that G and c are constants), we see that for a given density--as for example, mean stellar density--the maximum possible radius of a star is determined. Such an inequality not only defines a limit to stellar size but forbids close packing of stars in space. Stars can be organized together into a larger aggregate only if a lower value of $\bar{\rho}$ obtains. If $\bar{\rho}$ assumes the mean value of galactic density the argument may be repeated. The maximum size of a galaxy is determined by the same bound but with a lower value of $\bar{\rho}$. The repeated application of a potential bound, like in the Schwarzschild inequality, can account for the levels in the hierarchical modular structure observed in the universe. However, the inequality does not explain the particular set of $\bar{\rho}$'s which are observed in the universe nor does it indicate at what level the hierarchical modular structure may terminate. Potential bounds like the Schwarzschild limit may also be interpreted as bounding the maximum velocity a module may possess in a coordinate system at rest with respect to the aggregate. With this last interpretation, we see from Figure 1 that cosmic bodies are either "density limited" or "velocity limited." The "slope 3" line represents the limiting density of matter in a non-degenerate form. Solid cosmic bodies lie on or to the right of this line. (On the logarithmic scales used in the diagram, the planetary bodies appear to have essentially the same densities.) The "slope 1" line represents the observed location of the velocity limited bodies, i.e., the star, galaxy, cluster, and derived super cluster having the largest potentials or escape velocities. (This is an observed potential bound and differs in numerical value from the theoretical Schwarzschild bound. The objects falling on the observed bound, like those on the density bound, are non-degenerate.) The inequalities (1) and (2) may be put in the respective forms,

$$\bar{\rho}\tau^2 < B^* \quad \text{and} \quad \bar{\rho}R^2 < B$$

These inequalities have the same ingredients and we might expect them to have the same significance even though the values of the coupling constants are quite different.

On the basis of these similarities we might propose a theorem of the form:

Given

1. The existence of an aggregating force tending to bring modules into a condition of maximum compactness, (gravity in the case of cosmic bodies.)
2. The existence of a maximum limiting density, (the limit set by non-degenerate matter in the cosmic example.)
3. The existence of a potential bound or its equivalent, (such as the Schwarzschild Limit, in the gravitational case.)

then hierarchical modular structures provide a way for accommodating indefinite size while satisfying these intrinsic limitations. Specifically we are led to inequalities of the $\bar{\rho} R^2 < B$ or $\rho \tau^2 < B^*$ type. If we assume we may apply such a theorem to a city, then from $\bar{\sigma} R^2 \leq ac^2 \hat{\sigma} \hat{\tau}^2$, we see that for a given density, the size depends on a bound set by the effective velocity of travel and the maximum acceptable commuting time. The bound may be satisfied as N increases by increasing c, or alternatively the solution may be found in hierarchical structure.

If a polynucleated city develops on hierarchical lines, it will be stable so long as each nucleus and the complex of all the nuclei (with an overall lower density) satisfy the inequality, $\sigma R^2 < B$. However, the nuclei will not close pack, which means that if subsequent urban development fills in the areas between the nuclei bringing the mean density up to the level obtaining within a nucleus, the complex will surpass the limit. This sort of "filling in" process is occurring in the "megapolis" areas of the Eastern United States and Southern California. If these derived inequalities are valid, we will not escape with impunity the destruction of our open spaces or the low density background between present cities.

Since no physical restrictions governing the distribution of density in the city exist as in the cosmic case, there are other possible solutions. It can be shown that

the bound may be satisfied by selecting a density distribution $\sigma(r) \sim r^{-(\gamma+1)}$ where $\gamma > 1$. In this case, the city may grow and still satisfy the bound if it is built in a ring shape. Several suggestions of this sort have been made including a city which is nothing but a series of linear structures several stories high with freeways on top.

Additional limit theorems on the structure of cities may be derived. However, these require more sophisticated models and exceed the parallelisms in the hierarchical modular analogy given. Since our purpose here is not to develop a general theory of urban structure, but to illustrate the method of morphological parallelism, this one analogy will suffice. The method of morphological analogy does <u>not</u> per se generate valid theories. It produces hypotheses and ideas on which models may be constructed. These must then be tested by the usual canons of scientific verification.

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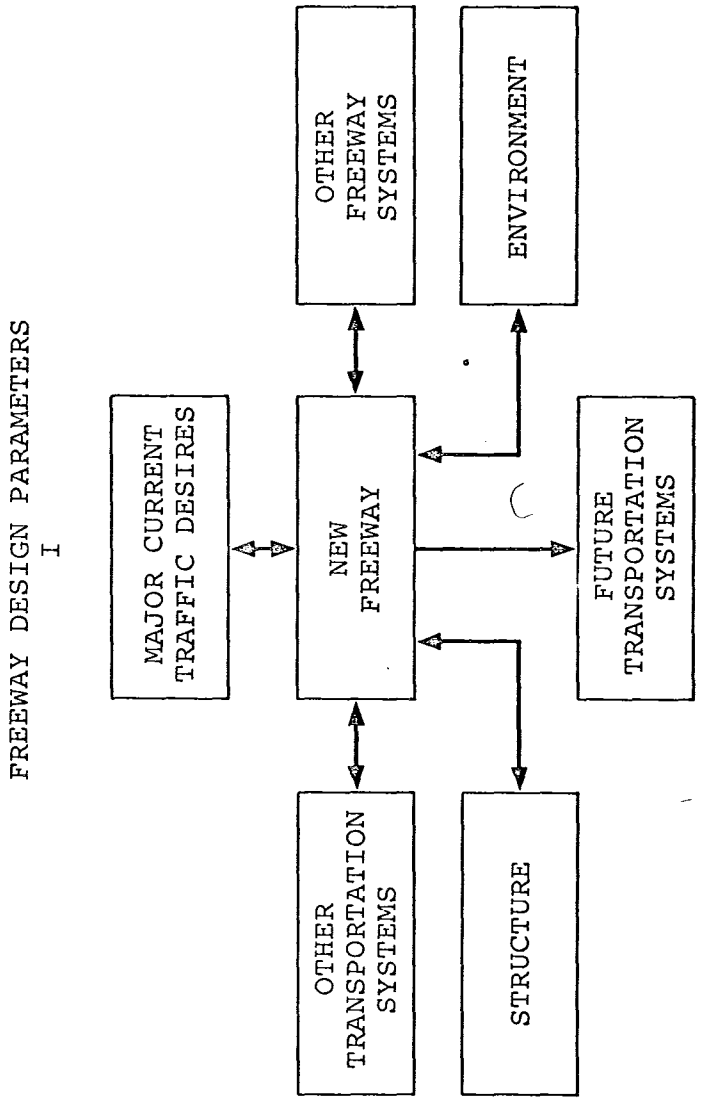
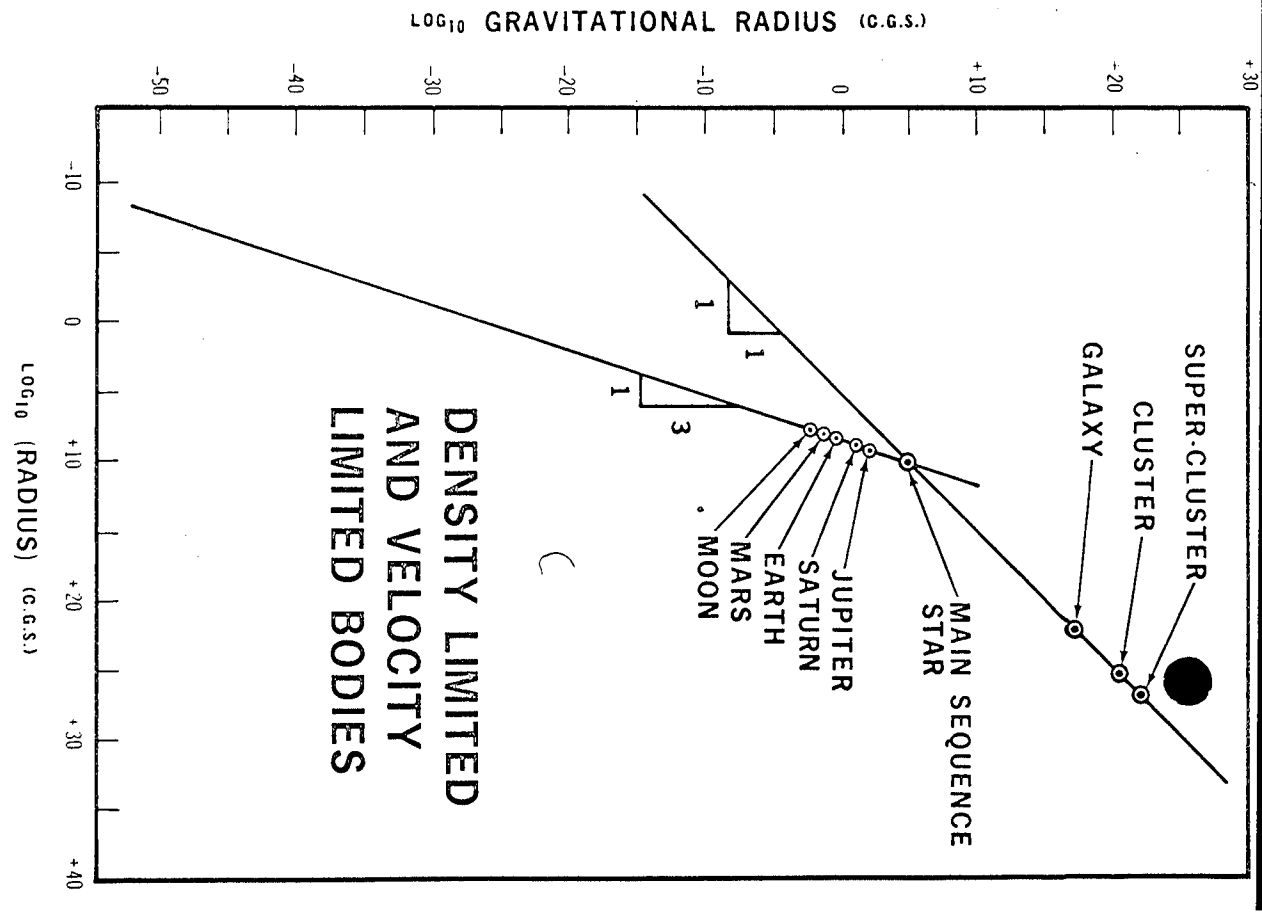


FREEWAY DESIGN PARAMETERS
II

Internal	Environmental
Constructional	**Physical**
Earthwork costs	Catchment areas
Bridge costs	Drainage patterns
Pavement and subgrade costs	Weather effects
Construction interference	Air pollution
Economic	**Economic**
Land costs	Regional land development
Public financial losses	Local land development
User costs	Non-recompensable public and private loss
Obsolescence	
Operational	**Esthetic**
Travel time	Eyesores
Local accessibility and integrity	Noise
Safety	
Maintenance and services	
Self induced congestion	



MORPHOLOGICAL CONSTRUCTION*

Albert Wilson

In all levels of forecasting and planning, it is important that we have a systematic exploratory technique providing a survey of all the policies, approaches, strategies, and opportunities that may become available. Morphological construction is a methodology for the systematic exploration of the totality of possibilities within an explicitly defined situation. The term, *morphology,* was adapted by the astrophysicist, Fritz Zwicky, to stand for three basic techniques of systematic exploration. These are: **systematic field coverage** which is concerned with delineation and the search for limits; **negation and reconstruction** which is concerned with varying basic assumptions; and the **morphological box** which is concerned with the totality of alternatives within a defined domain. To these three, a fourth called **morphological spaces** has been added by Ayres to describe the dynamics of technological development.

Morphology may operate at the frontiers of feasibility to find a route or may operate behind the lines to discover alternative routes. According to Zwicky, there are three types of problem that morphological analysis attempts to solve:

> What devices are necessary to obtain all of the information about a given set of phenomena;
>
> What is the sequence of all effects issuing from a given cause;
>
> What are all the solutions of a given problem.

In addition, the morphological box is a useful taxonomic matrix for indexing and classifying the information, effects, or solutions which have been given parametric entitation.

For the survey of alternatives, we shall be primarily concerned with the construction of morphological matrices, but the delineation of limits and variation of assumptions are also useful techniques for futurologists and will be briefly described.

The technique of systematic field coverage is a technique of infiltration of unknown territory, usually by successive approximations, using extrapolations, interpolations, analogies, and inversions. Extrapolation, interpolation, and analogy are meant in the usual sense, but by **inversion** is meant the identification of any dualism and the interchanging of parts or roles. An example of inversion would be the design solution for a dipole antenna for high speed aircraft when location in the airstream is not feasible. A dipole may be *either* a linear conductor surrounded by a non-conductor *or* a linear non-conductor slot imbeded in a conductor. The *inversion* of the usual approach solves the problem when a tubular slot is placed within the conducting fuselage. A favorite Zwicky example of a problem solved by inversion is How to moisten a postage stamp that has fallen on a dirty floor and there is no sponge or water nearby—lick the envelope, not the stamp.

Edward de Bono illustrates **inversion** with the example of the old grandmother who, knitting by the fire, could not keep her two-year old grandchild from tangling her wool. Put into a playpen, the child howled so much she still couldn't knit. Grandmother solved the problem by getting into the playpen herself, leaving the toddler free but out of reach of her yarn.

Rather than being barriers, **limits** frequently turn out to be clues to deeper understanding and the opening of entire new fields. One of the first limits discovered was the fact that no more than five regular polyhedra can exist in three dimensional Euclidean space. This limit fascinated the Greeks and Euclid's geometry was supposedly formalized solely to prove this fact. The limitation that water could not be pumped over thirty-three feet at sea level led to the discovery of atmospheric pressure. Today the absence of meteoroids with hyperbolic velocities and the existence of the Schwarzschild limit in gravitational potentials have led to important concepts about space and matter.

The technique of **negation and reconstruction** is very important both for enlarging the spectrum of possibilities and for breaking out of theoretical cul-de-sacs. The basic approach is simply to reverse the truth value of each basic assumption. The century old frustration with Euclid's fifth axiom of parallels was ended and fruitful fields of research were opened when it was negated. Even when an assumption is valid, a deeper understanding of its role in the system can be obtained by its negation. Some of the most imaginative possibilities are disclosed by this technique.

The construction of **morphological matrices** to exhaust all of the possibilities lying in a defined situation may be summarized by the following steps:

- The problem to be solved must be exactly formulated;
- All of the parameters which might enter into the solution of the given problem must be identified and characterized;
- The multidimensional morphological matrix for the given problem is constructed with one dimension corresponding to the sets of values assumed by each parameter, i.e., if there are n parameters, there will be $n + 1$ dimensions;
- All of the possible solutions (each possible combination of values for the parameters defining one solution) are evaluated with respect to the purposes which are to be achieved and assessed according to state-of-the-art, economic, sequential, axiological criteria;
- The optimally suitable solutions are selected for implementation, in practice this reduction usually requires a supplementary morphological study.

The most critical feature of the method is that step three and step four be kept independent and that step three be complete before step four is begun. That is to say, the generation of the matrix must continue without prejudice regarding the feasibility, desirability, or even, plausibility of any one solution. Only *after* the complete matrix has been constructed is evaluation to begin.

As an illustration of the construction of a morphological matrix, let us consider the morphology of solutions to the problem of world-wide population limitation subject to the restrictions imposed on us by the present state-of-the-art, but not to the proscriptions of any value system.

Putting the problem on a global scale removes emigration from possible solutions—emigration to other inhabitable planets being beyond the present state-of-the-art. Placing large sections of the population in "deep freeze" or some form of suspended animation or lengthening the gestation period from say, nine months to nine years, are also excluded from possible solutions on the basis of state-of-the-art. Our considerations then are reduced to the prevention of life and to the termination of life.

We have therefore arrived at the first parameter which we may call the *phase* parameter. Its values are the phases during which limiting actions take place. There are four distinct phases: pre-

sexual union, sexual intercourse, conception to birth, and post birth. The first two phases relate to the prevention of life, the last two the termination of life.

A second parameter has to do with the *type* of preventive or terminative action. Five categories occur: 1)cataclysmic interference with life or reproductive processes; 2)sustinence deprivation; 3)prey or disease; 4)rythymic or time factors; and 5)psychological modifications.

A third parameter has to do with whether the actions are unintentional (accidental), voluntary, or coerced. A fourth parameter differentiates between actions performed by or on an individual, sub-group, or mass—individual defined here to also mean a couple. The morphological matrix takes the form:

Morphology of Population Limitation

P_1 phase when terminated	pre-sexual	sexual	pre-birth	post-birth
P_2 method of termination	cataclysmic interference	sustinance deprivation (food, air, energy, hormones, sperm, etc.)	prey or disease	time factors: rhythm, aging, decay / psycho-logical modifica-tion
P_3 mode of action	unintentional (accidental)	voluntary	coerced	
P_4 recipient of action	individual	sub-groups	collective	

An inventory of specific actions or approaches to population limitation can be made using the morphological characterizations of the above matrix. The four digit indicators of a specific action need only give the values assumed in the matrix by P_1, P_2, P_3, and P_4 respectively. Thus in the example of

miscarriage (3, 1, 1, 1)

the phase parameter, P_1, takes on the value 3, the period from conception to birth. The type parameter, P_2, assumes its first value—cataclysmic interference. The mode parameter, P_3, is usually (not always) unintentional and therefore value one, and the aggregate is the individual or value one for the fourth parameter, P_4.

Inventory of Solutions

Abortion ..... (3, 1, 2, 1)
Miscarriage ..... (3, 1, 1, 1)
Infanticide ..... (4, 1, 3, –)
Famine ..... (4, 2, 1, –)
Plague ..... (4, 3, 1, 2)
Genocide ..... (4, 1, 3, 3)
Pill ..... (1, 2, 2, 1)
Condom ..... (2, 2, 2, 1)
Sterilization ..... (1, 1, –, 1)
Celibacy ..... (–, 5, 2, 1)
Impotency ..... (2, 5, 1, 1)

A hyphen in the description indicates an under-determined matrix.

Many of the named solutions cover more than one box in the morphological matrix. This is due to the non-specificity of many of the terms in our language. For example, sterilization (vasectomy) can be represented by:

individual, voluntary (1, 1, 2, 1)
individual, coerced (1, 1, 3, 1)
sub-group, voluntary (1, 1, 2, 2)
sub-group, coerced (1, 1, 3, 2).

A finer structure can be introduced into the matrix through additional discriminations such as whether sterilization is of the male or female, is reversible or irreversible, etc. However, since the parameters elaborating the fine structure of sterilization are irrelevant for the species of sustinence deprivation, rather than make one matrix containing all of the refinements, it is better to use a hierarchy of several matrices. A morphological matrix of a broad field should not contain parameters suitable only for the morphology of a sub-field.

Of course many of the individual solutions listed are excluded from realization because of our value systems. But it is only *after* all of the possibilities are listed that we should look at the solutions axiologically to decide which are acceptable and which are not. For example, many would immediately exclude solutions with $P_3 = 3$, that is, solutions of a coercive nature. A morphological matrix is seen to be a useful display for exploring our values and value systems.

The difficult task in morphological construction is the determination of a good set of parameters, i.e., a set that generates a matrix such that every box in the matrix represents a different solution and no solution can be formed that does not correspond to one box. The identification of a set of meaningful parameters or descriptors is one of the most basic epistemological activities. It is the task of relating complex and unique entities through their differences and similarities, a basic human cognitive process closely related to our perceptive and conceptive abilities.

Both differences and similiarities intrigue us. Differences intrigue because of the uniqueness of every individual, the great possibility for variety within constraints or variations on a theme—all basic to art and creative expression. Similarities intrigue because they suggest unifying principles, the unity and relatedness of everything, the economies and symmetries of all organization—all basic to science and systematic knowledge. The charm of varieties and uniqueness balance the elegance of symmetries and invariance. The artist searches for new ways in which things can be different, the scientist searches for additional ways in which they are the same. The morphologist must do both.

In the morphological study of any system or problem, we are searching for both unifying principles and essential differences. We are looking for the set of primary parameters or *ortho-parameters* which will show these attributes most trenchantly and succinctly. Only in a few systems has significant headway been made toward the discovery of ortho-parameters. In classical mechanics, the original Newtonian parameters of mass, force, and acceleration were replaced by the more elegant representations of generalized coordinates and Lagrangian functions (differences of kinetic and potential energy). These in turn were replaced by even more elegant and symmetrical relations—the Hamiltonian functions. The ortho-parameters of the systems of classical mechanics seem to be the generalized coordinates of

momentum, energy, and time. Another example of elegant parameterization displaying a wide variety of possible relations is the periodic table of chemical elements and electron distribution in shells.

The basic question of how do we find the otho-parameters of other systems has no simple answer. In fact, it may have no answer since much of the structure of nature is in our conceptions and an ortho-parameter is what we define it to be. None the less, we seek parameters with economical and unique representations that are as comprehensive as possible. How do we do this? There is no explicit procedure. All we can do is list several aids for morphological parameterization.

Aids for Morphological Parameterization

- Start with a list that includes a large number of known solutions. Cluster or group these known solutions according to common characteristics. Common characteristics are clues to parameters. For example, a list of solutions to population limitation may look like:

  contraceptive
  abortion
  war
  famine
  celibacy

  Next, cluster the list according to common characteristics such as:

  life preventing: contraceptives, celibacy

  life terminating: war, famine, abortion.

  Continue to add clusters of commonality such as:

  cataclysmic intervention: abortion, was

  psychological intervention: celibacy

  sustinance deprivation: famine, contraceptive.

  The list should be clustered in as many ways as come to mind. Do not censor or rule out any possibilites at this stage. These sets of clusters suggest candidate parameters such as the phase parameter which emerges from the first two clusters or the type parameter which emerges from the second three clusters. Remember that solutions are *not* parameters. Each solution is represented by the intersection of a set of values of the parameters.

- Proceed by successive approximations. Attempt to parameterize solutions by two's, three's . . . approaching synthesis per analysis.

- Use whatever theory there is. The basic variables of theory are usually the ortho-parameters being sought.

- Redefine the limits. Oftimes a modification of the definition of the limits of the original problem leads to the detection of parameters.

- Change your viewpoint. For example, assume an active view of being in complete control, then assume a passive or deterministic view.

- Test candidate parameters for inclusion, that is, whether they are sub-cases of other parameters. Reject dependent clusterizations.

- Draft a candidate morphological matrix using test parameters. Test the draft matrix on known solutions purposefully ignored in the process of construction to see whether these known solutions are also uniquely generated.

The morphological box is not complete so long as a solution appears in two or more boxes, or if two or more solutions fall in the same box. If a solution shows up in two or more boxes, it usually means that you have an incorrect parameterization. If two or more solutions fall in the same box, you need to find additional parameters.

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MORPHOLOGY AND MODULARITY

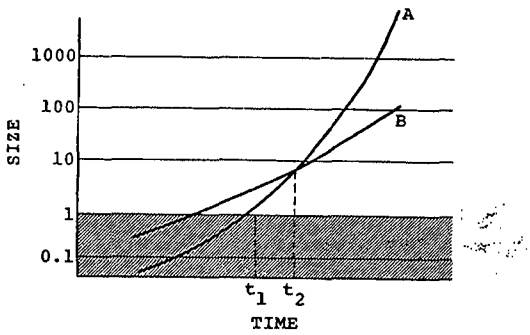
On the day that John Glenn made his historic three orbit flight of the earth, there was a particularly bad traffic jam on the west side of Los Angeles. I recall listening to progress of Friendship Seven on the car radio while embedded in the creeping glacier of traffic. While Glenn crossed Africa, the Indian ocean, Australia, and part of the Pacific Ocean, we moved eight blocks. There was ~~something~~ a contrasting in this situation that bothered me. I began to feel on that morning that we were not only getting a preview of the new capabilities which our technology was developing for the conquest of space, but we were also getting a preview of the consequences that unstructured use of technology was piling up for the conquest of us. For me this contrast was a warning that there were some serious deficiencies in our understanding of what was really happening as a result of the process of applying science and technology unexaminedly to the multifarious specific problems which attracted us. The cause of this and other unbalanced situations in our culture is not clear. Was it that we sought out and found challenge only in glamour problems such as the development of new capabilities to fly higher, to see further, to compute faster, finding little satisfaction in tackling the garbage problems like air pollution, traffic stagnation, and what it is that is most needful of being computed. or were there limitations to our methodologies for solving problems. Perhaps those we had already developed were only useful for certain classes of problems, like figuring out how to fly faster, and our methodologies could not cope with broader classes of problems. or was it simply that we were not taking into consideration for some reason, some very important parameters. An engineer riding with us saw no problem. "It is all very simple. The speed varies inversely as the density of the medium through which one moves. If you take the ratio of the density of matter and space where Glenn is, the density here on the freeway, take the square root; you will come up with approximately our ratio of speeds." Some parameter seems to be missing there too.

A few weeks ago, the world's largest oil tanker of 120,000 tons was wrecked off the east coast of England, releasing thousands of tons of crude oil which came ashore and destroyed hundreds of miles of beaches in a way which has tragically affected the means of livelihood of thousands of people, and cruelly contaminated the environment for hundreds of thousands more. Again, something important appears to have been left out of consideration in the application of our scientific and technical knowledge. I do not mean that we do not understand how properly to design large tankers and are overlooking some design factor; our engineering is undoubtedly sound, based on well established and proven principles. Even now we are building a tanker of 300,000 tons and designing one of 500,000 tons. Furthermore, the economics of the large tanker is sound. The savings accrued in bulk transport of oil are apodictic. Yet, navigational disasters may befall any vessel, no matter how large or how well

designed. These disasters striking from the environment we traditionally call "acts of God;" the large dominating the small, the universal controlling the particular, the whole determining the part. How can we possibly be responsible for that over which we have no control? This brand of theology is hardly any longer acceptable. The precarious level of technological development which we have recently reached in which we have the power to significantly alter our environment without having the power totally to control that environment imposes the greatest of responsibilities on what we choose or do not choose to do with our capabilities.

This disaster to the shores of England prompted our Secretary of the interior to comment, "The environmental backlash we confront today cannot be eliminated just by applying more of the same science and technology that put us in our present predicament." Some scientists would support this indictment of science and technology, and agree that Mr. Udall has placed the blame squarely where it belongs. Other scientists would object that it is grossly unfair to hold science and technology responsible for such a situation for there is, at present, no scientific knowledge which can answer the question, "What is the maximum size of tanker which should be built?" This type of question is not even amenable to scientific treatment. Mr. Udall speaks of, "the same science and technology that put us in our present predicament". This phrase has the implication that there may exist, if not other types of science and technology, then possible developments in science and technology which would provide the understanding that would avoid the creation of such predicaments. If this be so, then the search for the unincluded parameters whose omission is creating these problems is itself a legitimate research task. We can at least start by adopting this hypothesis and looking for possible ways to formulate the question.

One of the deficiencies in the present practice of application of science and technology is the failure to note that at some level of the state-of-the-art, how big we can build a tanker, and how big we should build a tanker, take on different answers. The problem may be formulated in very simple terms for purposes of illustrating this point.



In Figure 1 curve A is a capability curve showing how large a tanker may be constructed in accordance with the state-of-the-art as a function of the year. Curve B may represent some environmental tolerance or some second capability which in our present illustration may be measured by the number of tons of oil on beaches which we can in some way successfully neutralize. Let us assume that these curves cross in 1965. Assuming the economic incentive is always toward larger tankers, prior to 1965 the choice of what size tanker to build is governed

entirely by the technological limitations to tanker size; after 1965, if we allow for the possibility of disasters, we can weigh the economic gains of size against the losses in the event of a disaster, and make a choice as low as curve B and as high as curve A.

This naive two parameter formulation in no way reflects the real complexity of the problem, nor all of the interrelations which must be taken into account. it serves only to point to the fact that there exists two regimes; first, the regime of limited though developing capability, developing to the level where a solution is realizable. And second, the regime in which capability has reached a level demanding choice. Attitudes nourished in a regime of limited capability in which the choice is always made for the limit of capability, tend to carry over into the second regime. The difficult problems of choice are ignored by still opting for the limit of capability. Chambers of Commerce are still trying to attract population growth to their communities, an endeavor that made good sense in frontier days.

This formulation of the how big problem in terms of capability and environmental tolerance has also been used by some in their approach to nuclear strategy. In Figure 1, if the level of destruction is read for size, we have the current nuclear situation. Curve A represents the capability of nation one, or nation two, to impose a given level of destruction. Curve B represents the level of tolerance to destruction of nation one or nation two. The fact that the two capability curves and the two tolerance curves are not precisely identical is a negligible matter with respect to the level of destruction involved. In past wars the level of tolerance was always higher than the level of any enemy's capability for destruction. However, in the past two decades this order has been reversed. The implications are clear, but capability choices still derive from first regime thinking.

The phenomena of regime change is well understood by many business and government leaders. We have learned in this symposium some of the powerful new methods which are available to decision makers, allowing them to confront the full complexities of their problem and optimize their choices. unfortunately, many in a position of responsibility still fail to recognize the nature of the change from the limited capability regime to the mandatory choice ~~demanding~~ regime, and this, to the peril of us all.

The above is particularly evident in the number of existing nuclear warheads

2004 add electronic voting

ON MORPHOGENESIS

The second law of thermodynamics has long been recognized as a principle of degeneration, breaking higher order complexity into lower, measured by the increase of entropy or the decrease of information. From considerations of symmetry, it has also long been suspected that there exists a counter principle, a principle of morphogenesis, which builds up complexity, locally decreasing entropy and creating or injecting information. The very existence of complex entities throughout the universe requires some kind of principle of morphogenesis. This is a missing component of the current Big Bang cosmogonic hypothesis. How pure energy is converted into matter is not explained.[1]

While physics in the 20th century has introduced many new examples of the conversion of matter into energy: fission, fusion, matter/anti-matter encounters, etc., slight progress has been made in the understanding of the origins of matter and the building of complexity. However, a phenomenon called stochastic resonance has been observed which might prove to be an important component of morphogenesis. Stochastic resonance has such counter intuitive attributes as the adding of noise enhancing the signal, the presence of random fluctuations enhancing the propagation of waves.

Assuming for the moment the existence of matter as given, and postponing the question of how matter originated in the first place, we can start with the truism that morphogenesis involves **matter "eating" energy.** While this is literally true in the bio-world, in a metaphorical sense it also holds in other contexts. It is a further principle that all entities specialize in what they eat, and in time develop limits to what they can eat. No entity, with the possible exception of a black hole, can eat everything. We note this specialization even in atoms where each element has its particular selections of ν from the $h\nu$ or white noise smorgasbord.

In fact white noise may be the primary source of all information, the universal food on which all matter feeds and which through auto-interaction initiates and organizes all matter. No specie of matter, from a fundamental particle to a complex bio-organism, lives by bread (i.e. energy) alone, but by replenishing itself from those particular portions of the noise spectrum to which it has become habituated. Indeed, it is these habits in eating that manifest as the principle of plenitude.

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[1]Physics accounts for what follows once particles happen, the production of hydrogen, helium,... It is the initial raw radiation into particles that needs clarification. We need to ask what is the source of the information that is contained in protons, electrons, etc.