Contents of Volume III

Against Gods and Humbug

Preface to Volume III

Conduct-based principles are far more preferable than the principle-based conduct.

Essays in this volume explore enduring issues of human condition that result from incomplete knowledge of the worlds around. In dealings with incomplete information there is room for doubt. The challenge is to find a reality-based guide for actions and behaviors.

Therefore it is necessary to apply wide ranging tests to establish the tangibility of the content, context, and relations that may represent and define the concern and offer relevant solutions.

These essays apply and develop concepts for dealing with uncertainty and doubt in exploration and interactions for rational knowledge and conduct. Many of the ideas build on methods and examples from the sciences, game theory, philosophy, and literature are discussed in addition to the Nay concepts.

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October 20, 2002.

III-1. Paradox of Choices

If you don't have a dream, how can you have a dream come true?

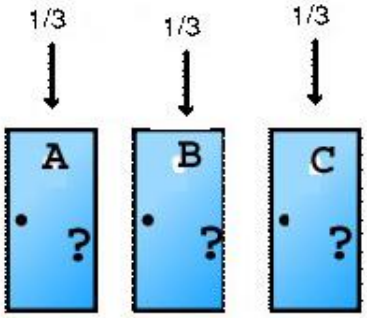
Consider a recent poll in which only 11% Americans said they were atheist. Among the rest about 15% called agonistics, and about 75% believed in a theistic construct such as God, omniscience, force, light, inspiration or whatever. About two thirds of the theists imagined God as a Father Figure. Among the members of the US National Academy of Sciences 9% were theistic believers.

Are theistic beliefs based on fact, insights, and understanding of the factors behind the choice? In the absence of any positive information about virtually any of the theistic constructs it is just a matter of beliefs. I believe that most believers are making a bet that *they do not want to be on the wrong side - just in case the God exists.* It is strengthened only by its representation as a judgmental all-knowing almighty whose domain includes after-life. Is this enough? Or it is merely a belief in the unknown and unknowable non-existent that does not influence anything except to affirm the behaviors of the believers. The International the forces of fundamentalism, and those in the US Presidential and grass root politics, seem to support this interpretation.

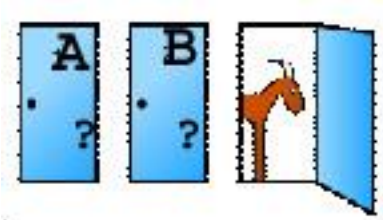
Can such imaginings be reasoned rationally? As one of my 9 year old grand-nephew Agam put it there is little to reason about the matters of faiths: You have it or you do not. Most of the faith-based reasoning is about justification and rationalizations of their constructs.

Hedging bets on the Monty Hall TV show

In this version of the game you the player is given the option of choosing one of the three doors, say A, B, and C.
Behind one door is a car; and a goat behind the other two.
***Step 1**. You pick a door, say door B. Without any prior knowledge you take random 1 in 3 chance of getting the car..*



Step 2. *Without opening Door B, Monty Hall opens door C behind which there is a goat:*



***Step 3.** Then he says to the player, "Do you want to switch to A?"*

Should you switch the first pick?

***Notes**: There are no tricks in this version of the game. Also Monty Hall does not try to trick you into choosing wrong door.*

Interest in this problem was sparked by a mis-stated version (by a mathematician) that was reproduced with mis-interpreted assumptions in a popular magazine. Was this a controversy?

Is the problem is culturally slanted for the American Audience? Most people in the world may be better off with a goat than a car. Of course that is my opinion.

Hedging your bets: Reasoning with available information helps in devising better and more useful hedging strategies. For such purposes one considers what one knows in the context of what one does not know about the world of the concern. In a game

what lies outside the world of the available information is out of bound or non-existent. Among other things such bounds are placed by the time and duration of a game, the size of the field and the tools, the number of players, and their drug doping habits. This way all the choices are defined for making a game plan and decisions to implement the strategy. The game is about dealing with the unknowns that are real in the sense that they exist and happen. The strategy of the opponent is one such unknown. All that lies outside the rules of the game is considered non-existent for the purpose of the game.

In devising strategies the options are separated as the unknowns versus the non-existent. One makes judicious choices from the unknowns, and discards the non-existent. Now how to hedge your net depends on your analytical abilities. As the field is initially sets Pascal argued that he is for theistic belief because he is on the right side if *God exists*, and if *it does not exist* Pascal is not on the wrong side. On the other hand, if it exists a non-believer would be on the wrong side. So the argument goes that since belief costs nothing it is better to hedge your bet as a believer. Here being on the wrong side still implicitly assumes the existence of the judgmental God. As developed in ancient works and my essays on this site that circular and self-referential assertions violate reality, and therefore about a non-existent.

Non-existent is without content and context.

All beliefs have consequences, including a belief in the non-existent. Consider the human progress of the last few hundred years. It is based on the belief in the known and testable. It facilitates search for the unknown that exists with demonstrable content and context. Anything without content and context is inconsequential and non-

existent, which can only be expressed by paradoxical and self-referential assertions. It is clear from the human history that constructs of non-existent contribute little of substance.

You have to play to win: What remains unsaid in this gambler's plight is that you do not lose if you do not play. Participation is necessary to win or loose. All decisions that do not influence the decision-maker are suspect. Consequences follow from decision to act, and also from a decision of not to act. Just as choices can be made without options, decisions can only be based on the basis of viable options. It is prudent to cut losses by refusing to play if the odds are stacked against you. As a group, gamblers always loose. Gambling is not just the zero-sum *some win and some loose*, but in reality it is *some win and most loose*. In gambling the chances of success are not in the favor of all the players combined.

Play is part of virtually all human activities. Play creates value by identifying viable alternatives. It becomes game if the reason to play is to win. Unless value is created each winner creates at least one looser. Lottery is neither a play nor a game. It is a gamble that does not create value. The combined total of all winnings are typically 80% of the wager. About 20% is taken off the table by the house. Thus only a part of the wager can be won back by the game players. In other words not only value is not created but 20% is lost even before the game of random draw begins to choose a few out of the thousands who made a bet. Yes, people do win. On rare occasions they win big. Typically, chances of being hit by lightening are much larger than hitting the jack-pot. Most who loose can also be thankful for not being hit by lightening. A general feature of such *less than zero sum* games is that the chances of success are staked against the players even

before the game begins. A study suggests that ten years after winning mega-million lotteries more than half the winners said that their quality of life is not any better than before. Also about two-thirds had very little tangible assets.

Nimrod game. Biblical origin of Nimrod is about mindless pursuit of a hunter. In the modern usage it describes a clueless-goofball. Take a simple version in this ancient Chinese game. Each of the two players around a circular table have a very large pile of pennies at their disposal to be put one each in alternate turns. One is not allowed to put a penny above another on he table. The game is that whoever puts the last penny on the table wins all the pennies on the table. Can you think of the reason why the game is already decided with the first move? If not here is the reason. A circular table has a unique space in the center, and beyond for each other place there is an equivalent symmetrical place on the table. Only an odd number of pennies can be placed on the table. So whoever starts the game will also be able to put the last penny to win all the pennies on the table. In such games one player locks-in the game after which none of the options available to the other player will ever give him an advantage. In other words in many games you have no chance of winning if the game is already locked in the favor of the opponent.

Randomness and Chance. Consider the consequences of random actions as in outcomes of several coin toss. In a single toss of a perfectly balanced coin the chances for head or tail are equal - provided the coin does not stand on its edge. Equal probability of head or tail does not change with the number of tosses. However, one can not predict outcome of any particular toss, and therefore in each trial your chances of winning or loosing remain equal. If the outcome is not random that means the coin is not balanced. It becomes clear only after a very large number of trials.

Go on stand-by. A scholar was granted a wish. He was tired of doing routine chores. A goddess impressed with the scholar's work gave him a clone that could happily do even the mindless chores. The only condition was that the scholar would give precise instructions for the next task as soon as the previous task was completed. Within hours the scholar realized that now he has even less time to do his work. He was giving instructions most of the time. Soon he came up with a solution. He asked the clone to erect a pole on the ground. Then he asked the clone to climb up, come back down, and then to repeat the task unless asked to do otherwise. Army regimentation and rituals are such do-loops for the stand-by mode.

Games worth playing create value. Value is incrementally created by a qualitative change in the content and the context. An infinite do-loop is not meaningful unless it has a definite outcome such as keeping the clone occupied. Binding actions (*karm-bandh*) that require commitments and mid-course correction have more direct consequences (*nikachit*). Behaviors that have definite outcomes are the trajectories of such consequential actions. Random tries, or acts with random outcomes (*nikaiy*), add up to nothing. Here are the reasons why only the games that create value are worth playing.

a. Random repetition of a task does not necessarily improve the chances of success. For survival one can not rely on finding money on the street, winning a lottery, or miracles.

b. Random tries work in your favor only if the coin is loaded in your favor. Chances of unfavorable outcomes can not be changed in coin toss or lottery. One could choose to play where chances of success are better than even. In a zero-sum game it means somebody else has to loose.

c. Even if it is not possible *to do things right first time*, at least one can learn from the things that went wrong, make an effort not to repeat the same mistakes.

d. Heuristic rules eliminate troublesome choices for midcourse corrections. Whether or not we like it, we could not get through a day without such corrections, restrictions and contingencies. It helps us avoid contradictions, inconsistencies, vicious cycles, and irreversible actions. Beyond that a tree-pruning strategy improves the chances of success with each step that is not to be back-traced.

Let's make a deal: In the Monty Hall television show a contestant faces three choices A, B and C. Behind one of these is a valuable item such as a car. The other two have worthless items. With this *incomplete* information available to the contestant the chance of choosing the car are 1 out of 3 or 1/3. After the contestant chooses say B. After that by opening the curtain C Monty shows that the car is not in C. At this point the contestant is given an option to chose A or remain with B. Should the contestant change the initial choice?

On the surface now there is 1 in 2 chance of having the car behind A, and an equal chance for B. The contestant can improve his own chances further by considering the options available to the host. In opening C the host has acted on additional information. It is now available to the contestant.

If the game is to be continued without showing the car the host must restrict the choice to opening A or B. If the car is behind A host has the option of opening B or C, i.e. the *conditional probability* of opening B is 1 in 2; the same for C. On the other hand, if the car is behind B the *conditional probability* of opening C over A (C | A) is 1 because A can not be opened. In other words, the combined probability that the host opens C is twice as much if

the car is in B than in A. In other words switching to B is to the advantage of the contestant. Note that the outcome would be very different if host opens A and shows that the car is not there.

Reexamination of the initial choice on the basis of the emerging information is quantitatively treated by the Bayesian theorem. It takes into consideration the additional information intrinsic in the conditional probabilities. Initial probability p(X) = 1/3, where X is A, B, or C. Consider the probability that host opens C:

p(opens C) = p(C)*p(opens C | B) + p(B)*p(opens B | B) +
p(C)*p(opens B | C) = (1/3)*(1/2) + (1/3)*0 +(1/3)*1 = 1/2

According to the Bayes' theorem opening B shows that the:

Final probability for the car in A:

P(A | opens B) = P(A) * P(opens B | A) / P(opens B)

i.e., initial probability for A (1/3) *probability of opening B | A (1/2) /probability of opening B (1/2) = 1/3 (or 1 in 3)

Similarly,

Final probability for the car in C:

P(C | opens B) = P(C) * P(opens B | C) / P(opens B)

i.e., initial probability for C (1/3)* probability of opening B | C (1) / probability of opening C (1/2)

= 2/3 (or 2 in 3).

Restraining Choices

Chances of success improve by following a trajectory of action modified to include the accumulated evidence. An ancient insight about random and chaotic events asserts: *Existence, persistence, and cessation are the fundamental characteristics of all that is real*. It builds on the perceptions that *the only constant is change,* and that *each qualitative change provides additional choices*. It has a flavor of mysticism mixed with statistical reasoning.

A trajectory of action has to constantly re-revaluate the choices offered by the changes in the variables and relations of the probable states, quantities, and quality. It pays to learn from successes as well as the failures. To improve the chances of success one can not hope to beat the stochastic odds of random events through persistent acts.

Risk-taking is inherent in all evaluations for the future actions. Reasoning is about moving from random and chaotic tries to an order that is consistent with the available information. Even in the face of uncertainty it pays to consider all viable choices and evaluate their likelihood. The tree of possible options is pruned by the emerging information. It is neither a gamble nor a compromise.

Sometimes there is no question even if there is a question, such as: How do you know you had a Great-great-grand father? Some times there is a question where there is no question, as in: God exists.

Here are some points and counterpoints for such a G:

Would you bet for or against G*?*

- If you did not know whether G was a goof-ball which you could not get rid of, or if G was a grand prize of eternal bliss?

- What will be your choice if all you knew was that no body knows what G is except what the believers say? It is only word of mouth that may have been put in some books. Nobody has presented credible evidence. Those who claim to have god-connection have not provided a consistent description, nor are their behaviors convincing.

- G is inaccessible by *real world arguments and criteria of evidence*. Nor can G be described (represented) by real world attributes. *[How can humans understand what can not be accessed and experienced by humans?]*

- G is a perfect creator who created man its own image. *[If so why is the man so imperfect? Could it be that the world is what it is? In this world all living beings strive for something better, and have potential to*

become perfect. Each being has its own level of perfection when it behaves in a totally consistent and non-contradictory way.]

- If G created the world, *where was it before creation*? If G was transcendent then and needed no support, *where is it now*? If no single being had the skill to make this world, *how can an immaterial god create that which is material*?

- If G is ever perfect and complete, *how could the will to create have arisen in it*? If, on the other hand, it is not perfect, *it could no more create the universe than a potter could*.

- Could G be an operator who takes care of all the different happenings in the universe at all the time? *[Could it be that each happening including the mind is outcome of action-consequence (physical) relations rooted in reality and nothing else.]*

- If all are to be judged by prescribed rules of behavior, *what are these rules? Do the believers live by these? Is there a record of reliable response to prayer or divine retribution to injustice? Why would a perfect G demand worship or submission? Would that not contradict perfection?*

- *Miracles happen. People do win lottery. These are neither good business models, nor do they create value.*

- *Is not-knowing a reason to believe in non-existent G?*

- *Does believing in a contradictory construct or a non-existent cause prevents us from creating value to realize our potential. Consider the social cost of 200 billion dollars of tax-deductible donations given to support G in US alone. Much of which does little to improve quality of life.*

Note: Such arguments developed during the preceding 2000 years were reviewed and summarized in a commentary by Gunratn (1430 CE) in ***Tark Rahasya Dipika***. Excerpts and text are included in Volume VIII in the Nay Section on this site. The arguments are further developed through out this volume and also in other Essays on this site. Also Surendra Nath DasGupta: *A History of Indian Philosophy* Vol. 1 (Cambridge University Press, 1922).

III-2. Representation for Potential

Potential lies in the promise of a premise. A viable premise has to be free of inconsistencies and contradictions. Premise shapes decisions because even if everything was possible everything is not worth doing. Our actions are guided by perceptions with incomplete information and consequences in doubt.

As such mind does not the real from unreal. Human mind deals with represented symbols to extract their meaning, significance, relevance, and potential. However, tangibility and validity of the resulting construct is to be evaluated by independent evidence by defined criteria. Sharing a construct facilitates playful manipulation to ascertain its veracity. Here if seeds represent dormant potential, all plants start out as weeds until we establish usability and serviceability. The process fails if it is self-referential. Such constructs based on ad hoc universals and omniscience close the human mind for new inputs.

Perceptions for conception of potential

* History is not something that happens to other people.

* Dare to be naive (Buckminster Fuller).

* Anything that exists is possible. (Kenneth Boulding).

* I had the good fortune of being able to make my plans in near perfect ignorance of my destination (Eric Hanson).

* At first people refuse to believe that a strange new thing can be done, and then they begin to hope it can be done. When it is done, all the world wonders why it was not done centuries ago (Frances Hodgson Burnett).

* Human beings are all right for as long as they are ignorant of Ignorance. This is our normal condition. But when we know we don't know, we can't stand it (Lewis Thomas).

* An innate preference for the represented subject over the real one: the defect of the real one was so apt to be a lack of representation. I like things that appeared, than one was sure (Henry James).

* If you ask me whether there is another world, well, if I thought there were, I would say so. But I don't say so. And I don't deny it. And I don't say there neither is, nor is not another world. And if you ask me about the beings produced by chance; or whether there is any fruit, any result, of good or bad actions; or whether a man who won the truth continues or not after death - to each or any of these questions do I give the same reply (Sanjay Belatthiputta, ca. 600 BC).

* Word about word by the people who have used words effectively! The meaning of the word is in its use (Wittgenstein).

* Concepts are attached to structures of activities external to mind. All languages are full of images and metaphors whose origin is being lost together with the art from which they are created (Robert Oppenheimer).

* When you think of alphabets, that are asked to bear all the human investigations and all the aspirations and appetites that we have and that have ever existed in human history - it is terribly abstract (Alan Gurganus).

* If men do not pour new wine in old bottles, they do something almost as bad: they invest old words with new meanings (Herbert A. Simon).

* Mathematics is a language that sometimes makes things clearer to me than do other languages, and that sometimes helps me discover things that I have been unable to discover with the use of other languages (J. Willard Gibbs).

* If you ask unconscious to give you information in your dreams it will oblige you. It is really amazing how the unconscious longs for ways to get in touch with us (S. Grafton).

Understanding the rules of the game. The criteria of space and time form the basis for all aspects of modern scientific methods. What may appear as disorder, chaos and complexity in our initial perceptions assumes order through representations. Its constructs emerge in stages. At what stage do we decide to play with the representation and how may be a matter of individual taste for the risk-taking and venturing out on a limb. Potential lies at the edges of interactions with our motifs and constructs.

Crosscurrents with conflicting trends and tendencies are all too dominant in the observed world. Unless processed it is not intuitively comprehensible to most of us. What we see at first glance is some kind of average of all happenings and the chatter of our minds. To get around it we learn to express the world experience in parts to which the language imposes linearity. The world is not linear or local, yet we identify with local order. We assign it identity through identified entities and events. As motifs such parts begin to have identifiable existence in all worlds of our experience. Representation and identification of motifs is possibly the first step towards what we will know and understand.

The divide-and-conquer strategy to represent and identify world through discrete symbols and metaphors leaves room for doubt. We acknowledge that through such search alone we may not know everything about what it is, let alone how it came to be and what lies ahead. But such balancing act with parts is critical for real-time decisions as well as contemplation. Such interaction with reality is about playing games with observed as well as about the playfulness of the observer. It is our privilege that as humans we can be players as well as the object of play, and know it. Our mind tries to understand us by looking at how look into our mind. Our interactions with the complexity of the inner and outer

worlds begin with assertions like *I exist*, *I think*, and *I am confused*. Therein lies the individual potential of the motif we call the self.

Humans are capable of the widest range of perceptions. It increases the range of our choices. Possibly for such reasons, our behaviors range from random and stone-blind to sublime, considerate, compassionate, and rational. This would not have been possible without shared motifs and goals. Such wide-ranging perceptions increase the range of awareness of certain representations and motifs. Perceptions are shaped by the extent to which an observer not only interacts, but is also willing to interact with the observed. Chaotic interactions with the disorder are not mere blips in perceptions. It is the way we pick and choose parts of the experience. Such eminence is not the pre-existence of "truth" but learning to identify emerging motifs.

The extent and quality of interaction with reality is part of probabilistic and philosophical approaches to identify "domain of reason and rationality." Not only the science would not be possible without it, but it extends to evaluation virtually all behaviors including learning, education, economics, and social sciences. In such evaluations the norm of the realized potential lies in the average behavior. The unrealized potential lies in the significant departures from the norm. As such, the norms do not distinguish animate from inanimate, or rational from irrational. What distinguishes them is the power to make decisions. It is a critical step for doing something about realizing the unrealized potential. It is not a uniquely human attributes, but they are better empowered by the social institutions.

Then there is the matter of emphasis and assumptions that shape our perceptions and its expression. If the emphasis is on eminence, what follows is an emphasis on the ways we handle the

experience of the past to guide the future. With this mindset one may speak of seeking knowledge or truth. It is possibly an extension of the childhood motifs where one looks for something that may be out there, or known to somebody out there.

One may start with the assumption that what exists is the reality. Our represented motifs are we experience of it, at least for the purpose of sharing. It does not make the representations entirely valid. In culling the complexity of a world for representation one remains aware of the fact that it does not represent the entire world. Representations are about the worlds of our awareness with a full realization that there are other known worlds, and there may be still other which we are not aware of. It does not give use the freedom to invent delusions. By rooting representations in awareness that can be shared, resulting motifs are useful for real-time interactions with those parts of the world that have affinity of the motif with the concern at hand. From this vantage point we motifs help us start a journey of explorations.

The view of pre-exiting truth is intrinsic in the term discovery. Consider the 'discovery of the New World.' It appears to ignore the fact that the land mass existed long before the Vikings or Christopher Columbus ever set foot on it. These continents were home to the millions of people and life forms some which are not extinct. This is not to undermine the fact that the route that Columbus discovered had a tremendous impact. The reality of discovering unknown continents opened new worlds. Just as the Cook's voyages took stock of all the land mass on Earth, resulting practices of technologies and resource use have also brought us to the realization that the planet also has other limits.

Rather than dwelling on the discovery of truth, in recent years the general emphasis of thought exploration has shifted to

the reality-based approaches. Known limits of the underlying reality also constrain thought and guide reason from one consistency to the next. Potential is in the resulting alternatives of the content and the contexts. Such limits are being better defined with knowledge that seeks to avoid contradictions and inconsistency rather than seek truth. In this journey it is far more appropriate and meaningful to talk about the versions of truth rather than a single truth. It is not unlike the versions of a computer programs, such as the versions of Windows. Not all of these are useful for all users, but the changes that stick around from generation to generation are useful.

Empirical exploration of reality is facilitated by representation of its parts. Resulting motifs and insights are discrete and necessarily tentative. However the method has done more for the human well-being than virtually any truth of the seers or seekers.

III-3. Feedback from Interactions

Behavior consequences are reward and punishment unto themselves. They provide opportunities for mid-course correction. Consequences rooted in judgment are wishful. It breeds fear and does little for mid-course correction.

Some people feel uneasy with the uncertainty that accompanies any search and exploration. Such unease about making real-time choices could be constructive if it is turned into prudence that facilitates continuing re-evaluation of the assumptions and experience. Others find it convenient to stay with the tried and true from the past, but it may be neither for the future.

Behavior consequences are rooted in the course we take. Perceptions evolve with the real-time needs and dealings and for the changing environment. Such perception feed into web of motives that influence decisions at each stage. Awareness of each event is a perturbation in a steady stream of the mental chatter. Inputs from identified events offer option to act or not to act next. With a high level of mental chatter the threshold for inputs is set high, and many of the concerns do not cohere. In such an environment perceptions are likely to remain chaotic.

Interactions and feedback. Pick your battles carefully. Do not get suckered in to wars that you do not understand. Limitations of ignorance and wishful constructs breakdown interfere with the checks and balances that offer real-time feedback. Decisions based on unsubstantiated inputs do the same. Individual initiative comes form the perceptions that cohere into decisions and actions.

Their feedback affirms the nature of the underlying reality. Actions acknowledged by feedback can be guided towards quality and reliability of the outcome. A qualitative change in the observer may be necessary to bring about a change in the quality of the feedback. It is a measure of the personal growth that occurs in the context of the institutions with which we interact. An action without usable feedback is merely *a flower that bloomed but never realized its potential*.

The bloom. It is an age-old question: *Did a flower bloom if nobody saw the bloom*? Feedback brings awareness of reality that guides perceptions towards the potential of *the flower that bloomed*. Interactions of a bloom with bees are has potential for both: Bee gets the food and in return it spreads the genetic material of the plant. Not quite *quid pro quo*, but consequential none the less. On the other hand, without such interaction the bloom is one more nonproductive, fruitless and inconsequential random event in the universe. In effect such a bloom never happened. The flower might as well have not bloomed. Such actions become evolutionary dead-end.

Is it by design? Mutual dependences (liking, preference, symbiosis) are based on survival strategies. Such behaviors are built into the awareness and responses to sense inputs. For a bee it may be the color and scent of the flower. For the flower it may be the mechanical stimulation of its parts by the bee. If we can call it that, such perceptual drives have evolutionary memories that came about from feed back that guided both bee and flower towards interaction that are beneficial to both. Such interactions evolve and continue without the prior knowledge of the strategies, processes, causality, functions and mechanism at work.

What brings a bee to a flower? Survival needs of the bee and flower are intertwined. It is microcosm of a much larger web of the interdependences in the biosphere. Both bee and flower are guided by feedback. Bee comes to a flower because the flower can not go to the bee. But flower does things to attract the bee. The he 'quality' of interaction encourages both. In a narrow sense, the color, shape, and fragrance are the measures of the quality. Does the bee know this? As a group bees certainly work for it. Do bees see their role in the bigger scheme of things? Irrespective of the answer all the components of the puzzle have come together in the evolution of a successful strategy. It may fail if human continue to interfere with such interactions. Just as bees, insects, and birds were here before came on the scene, they are also likely to be here after humans are gone.

As a metaphor for the absence of bee or the flower, imagine if a bee did nothing for the flower. Without a viable alternation, the end result would be nothing short of disaster. Most plants would not propagate and strengthen their genetic stock. Do bees and flowers *know* this? Its evolutionary memory is part of the collective existence and persistence of the species. Mutual dependence assures sustainability of all. It is a testimony of what worked. We can not even guess what did not work. We can only take a note of the fact that over-grazers tend to threaten their own survival.

In the grand design, without such interdependences among the organisms the universe would certainly become a lot more inanimate place.

III-4. What Is Rationality?

The worm does well obedient to its kind.

- Buddh

Were I
A Spirit free, to choose for my own share,
I'd be a *Dog*, a *Monkey*, or a *Bear*.
Or anything but that vain Animal,
Who is so proud of being rational.

- *Satyr Against Reason and Mankind* (Rochester, 1675)

What is a better guide: Principle-based conduct or the conduct-based principle? It is about realizing the potential. Beings realize potential by processing the whole gamut of inputs into behaviors. Its potential is not about a pie-in-the-sky kind or wishful idealization. Potential is not realized by adhering to rituals. Nor is it served by polarized dialectic of a particular value, reason or cause. Such constructs attract attention, evoke emotion, and encourage adherence. They are smoke without fire: Not very meaningful.

Rational behavior for sustainable existence is a necessity. We learn of its potential and limitations through practice. Without such appreciation, one tends to gravitate towards endless augmentations of perfect truth or omniscience.

Logic alone does not guide behaviors. As applied in limited contexts logic can serve different masters to build selective theories and constructs based on inputs of their choosing.

Attributes of rational behavior emerge from consistency of conduct. Its success is rooted in the quality of interaction inherent in description, interpretation and generalization of the verifiable observed and experienced.

In a search one of the purposes of reason is to bring the criteria and objective in resonance with reality. Reasoning helps us take stock of what we have to evaluate its potential. For such dealings we rely on what we understand. Often it is also necessary to consider what else may be out there.

Reasoning brings states of perception in line with the identified elements of reality. It may not be hard-wired in our brain. But we learn to rely on it to make sense of the experiences. Reason may strengthen a template of perceived choices that could rapidly filter the inputs for real-time decision to respond. In the longer term, reasoning provides a common basis to validate behaviors both real and hypothetical. Such projections take us out the cocoons of our own experiences and constructs.

- Have you ever wondered how a coherent decoheres to become incoherent?
- Rationally selected means can destroy rational thought (*Klemens Szaniawski*).

Arrow's impossibility theorem. In his Nobel Prize winning work Kenneth Arrow showed that it is impossible to aggregate the individual preferences into social preferences. Consider the preferences of human groups A, B and C for three flavors of ice cream: p (vanilla), q (nut), and r (berry). Suppose the three groups rate the individual preferences in the scale of 1 (most), 2 and 3 (least) with the following results:

Group/flavor	p (vanilla)	q (nut)	r (berry)
A	1	2	3
B	2	3	1
C	3	1	2

Consider how the three groups will vote their preference between pairs of flavors. People will vote for one of the two flavors higher in their preferences (even though their number one choice may be different from the two being considered).

Between p and q: A will vote for p, B for p, and C for q (= 2/3 for p/q)

Between q and r: A for q, B for r, and C for q (=2/3 for q/r)

Between p and r: A for p, B for r, and C for r (=2/3 for r/p)

In the contest for each flavor paired with the one of the other each is voted by 2/3 groups. Also the order of preference changes depending on the pairs. The result also leads to a paradox of *impossibility*: In the first vote p is preferred over q; in the second q is preferred over r; **but in the third r is preferred over p**. On the other hand, logically one would have expected: If p is preferred over q, and q preferred over r**, then p must be preferred over r**.

This theorem demonstrates that our arbitrary individual preferences, as well as our naive intuitions about choices, cannot be counted upon to yield a coherent and consistent outcome. It is far more important to realize that there is no method to construct social preferences from arbitrary individual preferences. In matters of social and political choices, we are often satisfied with the pair of choices, without looking at all the choices. One way to get around the limitation is consider the choice between p or q or none.

III-5. Meaning to a Speck of Dust

Phenomena implicate and explicate order in the epistemology.

Practice gives meaning. As the particulars of the experience identified in the experience, generalizations are abstracted. Such abstractions are analytical tools that give meaning to the particulars of an individual, an entity, a single act, a digit, a word, or a dab of color. To move along:

1. Think of a dot on a sheet of paper. Existence of the dot ascertains *it is.* Only by default we say *it is not* there on the rest of the sheet. Here *it is not* is not ascertained by the existence of 'is not' but by the existence of the paper in relation to the dot. In addition to the content (dot) all representations also have a context. Representation of one and only one dot on an otherwise blank sheet of paper is the context to assert absence of 'such content' on a blank paper.

2. In the Boolean world *is so* is represented by 1, and everything else is *is not so* represented by 0. In this universe 0 is the representational space for 1. Thus 1 is all and 0 is nothing. And there is nothing else in this universe.

3. To break out of the confines of binary universe, imagine a speck of dust in space. By itself, an isolated speck of dust exists but has little else by way of meaning, significance, or information content. A meaning emerges if we establish that many more specks of the same kind exist in a confined space. The finding assumes added significance if specks are identified to be of dandruff, pollen, anthrax bacteria, or virus particles. Through

such measures we evaluate the quality of the environment. The same goes for all other measures of quality.

4. A class with defined characteristics and behaviors assumes added significance. For example information conveyed by a sentence is more than that conveyed by all of the words individually, or in a random order. The quality of information improves with higher levels of organization, such as paragraph, chapter, book, and a shelf of books on the subject. Patterns emerging at each level of hierarchy enhance meaning and reduce uncertainty. Reliability and content of information increase with an increase in the order as well as the quality of the component individuals. Patterns over a period of time are for examples assume added significance to identify norms and outliers.

5. Patterns result from relations. A series of dots make a line. Dots in two-dimensional may give perception of an object, and appearance of a moving object id appropriately time resolved as in a television picture. It is also in the nature of discreteness that virtual reality emerges with manipulated matrices of points.

6. Viewed this way point is a zero-dimensional matrix, a line is a one-dimensional matrix, a picture or graph is usually two-dimensional matrix. Our sensory space is cued for a time resolved three-dimensional matrix. In our mental interpretations we often superimpose such information with other dimensions of our concerns. Thus mental constructs of our experience are multi-dimensional matrices. This matrix approach provides a basis to view perceptions as matrices of undefined dimensionality because they are influenced by varying degrees of chaos and disorder.

Concepts of rationality and potential build on the transition from randomness to chaos to order. Rational behaviors call for consistency, whereas potential lies in including the disordered parts into the order.

III-6. The Unknown and the Doubtful

Doubt is intrinsic in assertion based on a point of view, a generalization, a stable or momentary insight, or a meaning of the word and its derivatives, as well as the personal knowledge.

- Samantbhadr (ca. 200 CE).

Identifiable contradictions are cause for concern because they are associated with the intangibles. Faith sweeps away contradictions under the rug and replaces these by a set of unknowable that can only be described in self-referential ways. For the origins of the foundation of the evidence-based analysis with verifiable parts consider:

Q. Can a concern be addressed from what we know about it or from what we do not know about it?

A. Certainly a concern can not be addressed without information that can affirm assertion. However, to see the concern as a whole it is also necessary to know what is not known about it.

Evidence based assertions and practice-based conduct affirm what we know, and also point to what we do not know. We also use a large number of words (Table IV-1) to hide such ignorance, and express things that fall some where in-between. Need for such words attests to the lack of a perfect plan for human condition or at least for the constructs of it.

Word abstractions do not attest to the reality of a construct. Words do not the necessarily focus even on a single state. Word identification is only an early step in addressing a concern. Having a word for a feeling does not necessarily mean that we know what it is about. English language is remarkably adept at having terms for states of ignorance while shedding little light on

such states. Diplomats, politicians, negotiators and experts of all stripes have turned the expression of ignorance into an art form. Commenting on the fact that *Sun never set over the British Empire*, a humorist added, *not even God could trust the British in the dark.*

Words to express perceived doubt are not necessarily synonymous. They emphasize quality of distinguishable states. The range of partial-truth values enhances our appreciation and experience of entities, events, observations, thoughts, and actions. Considering the mere number of such states, it is not surprising that most people are occupied with such concerns. Words to distinguish the difference enhance awareness that often helps in finding solutions.

Doubt suggests disorder and chaos. If certainty of order is desirable for representation, chaos is preferable to disorder.

We speak of perfect order if the prior knowledge can predict the outcome. It is like *you get what you ordered at a favorite restaurant where the management has not changed and the chef is not having a bad-hair day*.

Contrary to popular belief the state of total disorder or perfect order is rare and difficult to identify. Most of what we experience in life is chaos. Recall the frenzy in approaching a math problem in the 6th grade. In the hind sight it is invariably so simple, but not until superfluous connection imposed by the mind are severed.

However *it is impossible to separate milk from water when both are intermingled with each other. It is neither possible nor logical to separate two things, such as the life and matter when they are inextricably blended together in the body. No one can point out in such cases that this is one thing and this -another.* [Sanmati Tark, Siddhsen Divakar, ca. 500 CE].

III-7. Actions Have Consequences

A state without the means of some change is without the means of conservation.

- Edmund Burke, Reflections on the Revolution in France

Change is inevitable. Ability to realize potential of a change has enduring value to survive, thrive, and resolve conflicts. It helps make decisions and mid-course corrections, and take responsibility for the outcome, bear consequences. Since actions are consequential human can not be mere actors. Consequences are not mere cause and effect. Outcomes are not always easy to predict. A rational course of action (behavior) increases reliability towards desired outcome. Contradictions and distractions influence the outcome even before one acts.

What holds back? Representations provide a framework to search. Suitable criteria are also needed *for views from different windows and doors*. Real-time search is helped along by pruning certain options. Regress can be avoided if each new option is considered. Sometimes it is easier to learn from the experience of others. Disordered states of emptiness and self-doubt build attitudes of will-not, can-not, do-not, and need-not, closed-mind, boxed-in, hostile, disabled, unable, and not-interested.

Learning to deal with ignorance. We are prisoners of thoughts and words, and actions are often binding. Their content and meaning are chiseled in our perceptions by nurture and social influences, and possibly nature. No matter where one stands, rationality lies in a desire for qualitative change. It calls for an activist and multi-dimensional approach. Even if the overall task

appears daunting and most goals may never be achieved, outcome and consequences of incremental changes are likely to have greater impact over time. It is only prudent to avoid irreversible consequences. Wish carefully, it might come true.

III-8. Beginning of a Decision

Actualities seem to float in a wider sea of possibilities from out of which they were chosen; and somewhere determinism says, such possibilities exist, and form part of the truth (*reality*).

- William James

Ability to realize potential (#A142) is a part of sustainable interdependence (*pajatta)*. Most choose not to do so. More we know less we want to tender our ability to make choices. Choice is not about apparent product parity, but about exercising deeper appreciation of the goal and consequences.

Being inspired.

- When you are inspired, everything seems to work (Patanjali).
- By meaning more, our lives yield more. It is no longer a zero-sum game (An Arihant adage).
- Do the right things, not because of any rewards, but rather to prevent any regrets. (Advice to a young Samurai).
- Impossibility is the highest state of contradiction.

Avoiding regress. Actions based on unformulated models interfere with validation of perception and contribute little towards awareness. Pragmatism requires not digging dry wells in the pursuit of what cannot be proven affirmed or falsified. A model supported by matrix of questions and concerns is a useful way to explore the domain of reason without invoking anything out of the ordinary. It is an algorithmic way of processing information for relevance in terms of defined criteria. It builds on

a grammar of perceptual relations, that is different than the grammar of language or logic.

Like the routines of life, steps of algorithms may appear repetitive. However, at a deeper level hardly anything is ever repeated. One has to learn to see the difference and build on the distinctions. Gross similarities belie the subtle but critical differences that become far more significant in the action consequence cycle. The difference between the first and second place finish in an Olympic race is often less than tenth of a second.

To avoids regress one moves up a level with each iteration. It is like beating ones own previous best. Algorithmic approaches without regress are remarkably effective for contemplation, self-study, and self-improvement. It is possibly the way we build from the experiences to remain faithful to reality and develop more consistent and coherent perception.

The goal of experience is to internalize. Most people tend to lose sight of the wood by focusing on trees. Specifics of facts and experience are highly context-dependent. Often they lose relevance with change of place and time. It is up to individual perception to recognize the moment and find its relevance. Contemplation of the evident and inferred in terms of the past helps reestablish their relationship. It is a part of the decision-tree.

If nothing else a search stays on course as long as we heed and build on feedback. The purpose of the search is not the mere assimilation of facts. It is to gather and process facts relevant for the anticipated situation. Such abilities are developed through an appreciation of the way of asking a question, relating it to the relevant information, and then evaluation of the question and the information to seek relevant answers.

Progression in stages minimizes chances of regress. Progress in recognizable stages is forward-looking. It is the

strategy of dividing the task to conquer each limitation that can be defined. Since a search always starts with the present, clear recognition of the present includes a realistic assessment of the resources that includes the past. By taking stock of where you are, one gets insights into what lies beyond. New start is made after identifying with certainty where one stands. Relevance of the change may relate to personal growth, self-discovery, self-improvement, and other desirable behaviors.

Developing strategy. In matters of choices, all searches require inputs, resources, and reliance on rules and assumptions. Such considerations include.

1. A systematic search begins with a critical evaluation of the present to identify the resources and liabilities.
2. Real-time decision-making begins by identifying and weeding out contradictions.
3. Pragmatism calls for avoiding irreversible action and keeping viable options open as long as possible.
4. To avoid the wishful it is often necessary to identify the doubtful and evaluate its origins.
5. Feedback calls for discarding that which does not work, and including newer options.
6. Develop explicit criteria to resolve areas of conflict.
7. Thoughts and words guided by actions is not intended as doctrine but to guide choices and decisions by the feedback from practice.
8. Liabilities can be identified by systematically looking for broader consistency in a value-free fashion.
9. Not all ideas are created equal. Options are mental constructs of the future possibilities to facilitate the search, and initiate a dialog for understanding.

10. There is always something that lies beyond what we know. But we know that the infinite knowledge, wisdom, power, information, matter, or energy does not existent. Vigilance and prudence is also required in dealing with other wishful, paradoxical, and self-referential constructs.

Significance of enduring thoughts and words develops through practice. Mahatma Gandhi insisted that his truth-seekers (*sat-agrahi*) preach the way they live, and not the other way. Rai Chand Mehta brought this insight to his attention in 1891-92 during the morning walks. Gandhi applied it to develop a novel approach to resolve social and political conflicts.

Dynamics of evolution of a viable theory (*keval*) seeks coherence with practice. It searches for relevant alternatives (*anekant*) in the context of doubt and uncertainty (*syad*). This matrix of empirical thought is remarkably similar to the modern scientific methods that rely on hypotheses and models that conform to experimental results. Each cycle of the search is extended through reality based-assumptions to extend algorithm by adding yet another dimension to the search matrix.

When do we know we are there? Or are we there yet? Those who have played with Rubik cube know that even for a defined goal *often one does not know until we are there or at least close enough.*

III-9. Tools for Thought Search

As kids we play with puzzles. As grown up we live in one. Almost all the perceptions are a series of suppositions on the world - worked out and based on experience.

Perceptions (*itthi*) are influenced for change. Such formulation builds on understanding (*gyan*, cognition) of tangible parts, properties, and criteria used for representation. It is the sum total of our effort to internalize and articulate the observed and experienced. Manipulation of representation does not reproduce or replicate reality. A represented motif takes root in perceptions through active interactions that define the concept space within the word boundaries. We deal with the happenings with additional layers and hierarchies. Validity of motifs follows from their usefulness. It is necessary to reevaluate reliability of the parts, evidence, criteria, arguments, and assertions used to represent the motif. Such validation is based on involvement, interaction and feed back. Behaviors based on immutable rules stifle choices for decision-making.

Search is an evolutionary process. We come closer to the goal in stages. How would we know if we have arrived there? It is likely to be a pragmatic decision based on ones view of *close enough*. Meaningful search continue well beyond an individual. It is a method and process with incremental goal.

The word truth (***sacch***) related only to utterance and expression, and not to be confused with the *Truth* of the seers. Outright false expressions are not acknowledged as such. Such wishfulness may be true or false based on the knowledge of the individual making the utterance. To say *one tells lie* is to know the

speaker's mind. It is better judge assertions and inferences as *is-so* (***asti***) or *is-not-so* (***nasti*)**. These are just affirmations on the basis of the evidence. It is a critical *nay* device. It circumvents issues associated with the 'T**ruth'.** Such an absolute remains beyond reach *no matter how hard one tries to peel it*. One need not wait for that proverbial moment of enlightenment when *the entire truth reveals itself at once*. The very concept is rooted in ad hoc idealization that puts *cart before the horse*.

An evolutionary search with deep conceptual continuity builds on representations rooted in perception. It is invariably capable of influencing perceptions of other. Such feedback reduces the vagaries of immutable representations. It frees our imagination to develop a consistent and useful set of guidelines for dealing with the observed world on the basis of a set of secular relations and criteria. May be, it is far more useful to deal with the truth of perceptions as striptease where only parts are revealed to evoke contemplation.

III-10. Living with Doubt

At their starting point the existence of things had not yet begun. The next assumption was that though things existed, they had not yet begun to be separated. The next, that though things were separated in a sense, affirmation and negation had not yet begun. When affirmation and negation came into being, Tao faded. After Tao faded, then came one-sided attachments.

- Chuang Tsu (ca 300 BCE)

If the realm of faith is about the past, doubt rules the future. Often we are sure about our doubts, and doubtful about the certitudes. Here information is not knowledge. Also not all knowledge, and for that matter not all information, is created equal. Doubt penetrates the victories of the past as well as the optimism for the future.

What matters is the moment-to-moment perception that sets the compass. Except to evaluate the trajectory of the change that has already occurred, prior knowledge is not very useful for decisions about future - that too only if the variables and relations can be extracted with a reasonable degree of certainty. Even then a knowledgeable gambler can not make living. Living with reality of doubt calls for rational alternatives. No matter how much we try, real-time decisions are made without complete knowledge. We are guided mostly by the perception of *what is out there* – armed with our reptilian instincts.

An ancient Hebrew saying. Jacob and Yehuda went a Rabbi to settle their dispute. Jacob claimed "this land has been in my family for generations." Rabbi solemnly responded "Yes, yes, you

are right." Then Yehuda pleaded "My family has used this land for generations. Without us taking care of it would have become worthless." Rabbi concurred "Yes, yes, you are right." After hearing this, a by-stander commented, "O Wise one, you have agreed to both. This all seems very complicated." Rabbi nodded "Yes, yes, you are right."

One can only affirm on the basis of evidence. Beyond identifying some contradictions and inconsistencies we rarely have sufficient knowledge to make rational decisions about the future. In the absence of incomplete knowledge, pragmatism requires that we do not take irreversible steps that invariably have undesirable consequences including close the future options.

We deal with degrees of doubt and certainties to balance the outcome in a compassionate and secular fashion. Most behavioral studies suggest that as a general strategy to deal with the unknown: *Be nice to others <u>at least</u> first time, and then tit-for-tat*. It is an appeal for restraint to build a feedback loop while avoiding actions that can result in loss of future options, if not the opportunities.

I have done, but not ended. There is no end to what one can hope to discover and think about any subject of interest. Every serious subject is infinite. To me life consists of the fluctuation between two poles of the hither and thither between the two foundation pillars of the world. What we have not and will not achieve is permanence and the finality. As our understanding progresses, some of the questions become irrelevant: nature of life, 'chicken or egg'. They are transformed to fit the emerging framework.

Much remains to be done. It is another way to invoke the condition of ignorance or incomplete knowledge. Others are: What would you consider as direct (observed) or indirect (circumstantial, implicit, analogy) evidence? Do perceptions play a part in such characterizations? We are born with little knowledge? Even such states we begin to understand, predict, or control what goes on around us. To make up for such deficiencies we have the unique ability to process inputs and experience into the various levels of awareness and perception separated by layers of uncertainties. Of course, always there is a need for more knowledge, yet we are designed to deal with the unknown, until unless we decide to give up.

Perpetual human concerns: Consider the everlasting appeal of the titles of some chapters in : *The Next Fifty Years* (Ed. John Brokman, Vintage Books, 2002*): Nature of the Universe; Are We Alone, and Where? Toward a Theory of Moral Development; The Future of Happiness; Will We Still Be Sad? What is Life? What is to Come and How to Predict It? Are we going to Get Smarter? Mind, Brain, and Self; What Makes Us the Way We Are? Mastering Disease.*

III-11. Who to Trust?

At least for some, what matters is not the lack of knowledge, but pretensions of certainty and omniscience. Bigots and dictators of unaccountable authority thrive on dogmas and ideologies of horrible clarity.

Confidence in shared knowledge is not a matter of faith or belief. Consider increasing reliance on ways that peer into the state of our body, brain, and the future. We look for expert opinions and that works as long as we reserve the right to make a decision. Now consider the motivations behind the unending stream of information available free on the internet. Unless we know what we are looking for, the information is selective and chaotic. It is not very different than the other choices offered in a market-place., where the buyer beware.

Often reliability of the message is tied to the integrity and intentions of the messenger. When in doubt, the burden of evaluation falls on the user of the message.

Mother Teresa has been accorded sainthood for working with the poor of Calcutta. She herself has stated that she is not interested in alleviation of poverty. Her sole interest was in introducing the Catholic god to the poor.

III-12. Living with Incomplete Knowledge

Do not follow those who ignore reality. From the small seed of truth they bring forth the plant of falsehood.

Absence of complete knowledge is a perpetual human condition. It is likely to remain so as long as we choose to ignore relevant information.

We are wired to remembering and learning by associations with emotional experiences. It may be a way to reconcile without getting bogged down with what appears to be chaotic, if not disordered state of the observed. We also tend to forget most of what did not work or cohere into our perceptions. Over a period of time we learn that:

- The luck of the draw does not work more often than not.
- Order does not emerge from acquired wisdom, imparted insights, grace by judgment, and spontaneous or meditated enlightenment.

Ordered actions and efforts follow from ordered thoughts as information, knowledge, behaviors, and habits bring about a qualitative change in perceptions. A change in the quality of perceptions requires multi-dimensional interaction. Possibly a change in the matrix of mind is needed to develop domains of reason and rationality.

III-13. Do People Tell Lies?

Lies run sprints and truths run marathon. Cultural clouds of moral high ground drift in from far and away. We shroud ourselves into wishful fog of secrecy and wishful constructs that sting us into apparent invulnerability. Some prefer rumors to keep information in a state of confusion. Wishful constructs are landscapes of mind invented when people can not live with the reality. No wonder rumors and lies are mainstay of the virtual worlds of media. Ability to discriminate rumors and eliminate distractions to reason remain critical – particularly in the cyber-age.

Deceit is pervasive in natural world. It is more common across the species line. We are all such sinners. And often do it knowingly. In a recent study of college students in USA, even in non-threatening situations such as party-talks, on the average 60% of the statements were not correct. In another study, college students admitted that 70% of the time they lie in the excuses they use to wriggle out of academic deadlines. In both studies the count is by self-admission.

Philosophers motivated by Aristotle may argue that *if people are not telling truth then they are lying*. Are behaviors as simples as the binary 0 or 1 (on-or-off) of a computer chip? There is more to the tension between truthfulness and trickery. Words with different degrees of disregard for truth include: lies, wishful, bullshit, hogwash, humbug, balderdash, claptrap, hokum, drivel, buncombe, imposture, quackery, smoke and mirror.

We all embroider mask of theory over the whole face of nature. We are storytellers. We weave levels of meaning beyond

their superficial plots or the first level of meaning. Deeper levels of meaning are not the domains of only intellectuals or transcendental reasoning. The search does not necessarily require wading through long, obscure, and complex works.

Paradox of Wishful

Often it is not clear whether words are to inform or to sell - for deduction or for intention: Wishful choices make the consumer think that a brand is distinctive.

- White man speaks with forked tongue.
- My majesty detests falsehood. It is not in me to weave tall tales (Egyptian King Thutnose, 1479-1425 BCE).
- We sing loudest when we are loosing (Hemmingway).
- Promised truth is a commodity that is never delivered, yet we pay for it. We develop ideal of truth to fulfill obligations towards one's duty without knowing what would be the outcome.
- People never lie so much as after a hunt, during a war, or before an election.
- These are images. The truth lies beyond. To find that everything lacks reality and not to put an end to it all, this inconsistency is not an inconsistency at all; taken to extremes, the perception of the void coincides with the perception of the whole, and the entrance into the All. At last we begin to see, we grope no longer, we are reassured, we are confirmed... it is the faculty of enriching ourselves upon contact with unreality that we must seek. The mythology of mind is the most intuitive through the wishful.
- Faith is believing in something you know damn well ain't so. Lack of faith is not to believe in things you know damn well are so! Never utter these words: "I do not know this, therefore it is

false." One must study to know, know to understand, understand to judge.

- For justifying their animal ethics most Europeans believe that only the primates feel pain. Fish anglers are told to believe that fish do not feels pain.
- **Bandwagon effect**: How we are impressed with the reach of wishful. To appreciate what may be convincing to you we consider what we are served by others in spite of our best judgment. When we hear the same story everywhere you look and listen, we assume '*it must be true*.' And more people believe it is true, the more likely they are to repeat it, and thus the more likely you are to hear it.

Forked tongue: Forked tongue is the common weapon of mass deception (WMD). A disconnect between the self versus the cultural identities has earned Europeans a reputation of forked-tongue among the colonized people of all traditional societies of Asia, Africa, and the Americas. It is made worse by collusion of Church and State. The Vicotrians sermonized the world about virtues yet paid little attention to filth and depravation in their midst. Modern prophets of Human Rights and Globalization work with similar war cries. Traditional societies rarely judge others by their own standards. Fortunately most do not have to resort to *crocodile teeth* and *elephant tusks* and other reference to the reptilian character exhibited by diplomats, politicians and preachers alike.

What is lying? Whatever may be the evolutionary rationale, human societies display the widest range of varied, complex and premeditated deceptions. Thanks to the dye and bleach peddlers one would not know that only 10% of the blonds in USA are

naturally blond. For the enticed is it mere wishful or something more?

Truthful utterance is not about saying what comes to or what is on your mind. It is about what you know and think to be, and live with its consequences. For the dogmatic *the truth is what I believe is the truth.* For the powerful it is fear backed up with force. Legal and statistical truths have their own spins, so do many of the medical claims. Reality of the situation shows up in the long term consequences. Imagine the value of a meter on your TV screen that tells the fractional truth value of the pronouncements you hear from the talking heads, experts and politicians. Nothing stays under wraps and secrecy stifles truth. Paradox of truth is that only fools stifle truth when they can not bear its consequences. Imagine how of ten people do not tell truth even to their doctors.

False confessions. Desire to be on the winning side sways elections. Such bets increases the number of just-in-case-believers. Others are coerced into submission with overt or covert threats of "hell." False confessions are extracted by torture. Such methods have not disappeared with the Inquisitors of the Christian Church, or even if declared unacceptable by Geneva Convention. Pressure tactics are routinely used to elicit confessions missed with wishful and willful lying, distortions, and self-aggrandizing. The enforcers and interrogators often manipulate suspects into confessing to crimes they did not commit. Many have ended up on death row without being guilty of the crime.

Omniscience coexists with omnipotence. Truthfulness is the basis of the concept of justice. It continues to evolve. Not long

ago in Europe, even the search for reality was considered affront to Truth. It was a reason enough for beheading if the reason did not conform to the approved dogma. Social pressure is still applied in US in the form of bullying, hate mail and threatening phone calls if you do not agree with the fundamentalist positions on creationism, school prayer, or abortion. In last few decades we have come a long way to demand that *assumption of innocence unless proven guilty, the burden of proof is on the accuser and prosecutor*, and *punishment to match the crime*, and *be able to hear accusation and face the accuser*. Of course very few will agree that the system is perfect: Deep-pocket and legal maneuvering can still have the last say; big swindlers do not get punishment in proportion to that matted out to petty thieves.

No wonder we learn to say what others want to hear. Healthy skepticism is part of public discourse. We distort truth to gain advantage. Selective use and partial disclosure of information is an accepted strategy in dealings, and more so in impersonal dealings. Fog of lies and cloud of uncertainty is the business of opinion-makers. Providing lip service to *truth and justice for the people* is integral part of the political process. Such environment of shaded information breeds unproductive cynicism.

Did Shakespeare the writer exist?

Contrary to popular belief, in all likelihood the literary works attributed to Shakespeare (1564-1616) were not written by the bard for the Royalty who acted in 2 or 3 show per week. The bard had little educational background (possibly Grammar school), time, and resources to have access to the variety of international and cross-cultural experiences that are part of the writings attributed to the writer. It is not clear if the bard actor ever traveled outside England.

We virtually no factual account of Shakespeare the writer. There is no mention of such a writer, or of his death, in the contemporary publications. There are no known manuscripts of any of the great works of Shakespeare. There was no such contemporary literary tradition of individual writers in England from which the work could have sprouted. Only decades after the death of the bard, literary works attributed to Shakespeare were first published as an edited collection.

It has been suggested that the real writer could be Marlow (b.1564-?). He was recruited as a student at Cambridge and later sent clandestinely by Elizabeth I to spy on the activities of the Catholic Church in Italy. Another possibility has also been suggested. Recall that in 1611 the King James Bible was published as the *Word of God*. It was edited by some 40 scholars at Oxford and Cambridge from a version published 50 years earlier based on the more ancient Greek and Hebrew books. Recall that this was also the period when the European Universities were involved in reformulation for their own purposes of the material captured from other parts of the world. Could it be that following this tradition the works ascribed to Shakespeare came out of some such *committee*?

Dynamics of something *less than all truth* goes far deeper. To get around such limitations the thrust of the scientific search is on description of real-world behaviors. Inferences are valid only in the sense that they are falsified by evidence although they are falsifiable. On a more mundane level, motives for certain inferences come attached to the support. It has become necessary to guard against the 'findings' that may be encouraged by profit motives to tell *half-truth.*

Is it Lying or What?

In a recent wartime interview, an army captain in the Middle East desert made a disclaimer: "The sun-glasses I am wearing are not advertisement for their manufacturer X but to protect against the sun" By naming X the soldier just did exactly what he says he is not doing. Is it lying or what? Advertisements, propaganda and psychological operations (psi-op) rely on such dubious words to create a fog of uncertainty. If the soldier knows that he is advertising then he is a liar giving a contradictory statement but hiding behind the paradox of *I am a liar*. On the other hand if the soldier is stupid enough not to realize that he is advertising then the statement is true but wishful.

A US President and his Secretary of State made utterances during their pronouncements before the war in 2003. They relied on illogical negatives and implications to shape public opinion. With any facts, such assertions were designed to give an appearance of a logical argument. As it turned out even the so called evidence was fabricated after the decision to attack of Iraq had already been made. Who is responsible for such misinformation campaigns?

Sooner or later people do begin to lump together the clever, wishful and false assertions into reasons to be cynical. The situation is made worse as the perpetrators remain unaccountable even after the lies are exposed.

Procrastinator's excuse. For chronic procrastinators doing a task tomorrow or even next year, is infinitely preferable to doing it now. Most of us postpone work sometimes, but about 20% do it most of the time. From US college students the usual excuses are: I was sick, I didn't understand the assignment, I overslept, I forgot, I had bleeding gum, I had a family emergency, or my

grandma or grandpa died. The last excuse is made multiple times a years, and sometimes to the same professor. According to a recent study, in 70% of the cases excuses are pure fiction. Although both males and females use such excuses equally easily, the female professors are lied to more often. Most of these students say they felt a considerable amount of guilt as they lied to their instructor. Some even had residual guilt afterwards. But even the guilt-ridden excuse-makers said they would do it again.

Sniffing out cheaters is innate. Controlled studies demonstrate that humans from widely different cultures, ranging from the US college students to members of an Amazonian tribe, can identify when someone is reneging on some type of social agreement. It has been reported that a man, who suffered damage to one portion of the brain in a bicycle accident, lost the ability to detect a cheater, however, he remained able to reason and express emotions. It suggests that the ability to sniff cheaters may be linked to a particular region of the brain. The ability to spot a cheater is also seen in the behavior of a variety of species ranging from bats to baboons. Often it is in the interest of animals to help blood relatives without the promise of a reward. On the other hand, indiscriminately performing such favors can also hurt chances of survival for all.

People can spot cheaters. All systems of reciprocity are open to subtle cheating. The dialectic of cooperation and competition pushes social evolution. Since no individual can live by deception alone, deception has to be grounded in truth. When used too often, false signals loose their value. Animals also learn to be wary of lies. Sniffing out lies has great survival value. The body responds when one lies. People appear to have an innate ability to

determine when someone is cheating them out of a deal. To ward off such incursions in the future it is also useful to let the other side know that you have spotted them cheating.

There may only be one life to live but it is not a one-shot game. Cooperative and altruism evolve with multiple interactions in social behaviors where threat of wider retaliation by others encourages self-policing of social equilibrium against deviant and unfair moves. It is not tit-for –tat response because people learn with experience. Rational choices in one-shot games and behavior outcomes in single encounters may be quite different than the rational choices for equilibrium behaviors. This may explain be the reason for advice *be nice first time* or *be kind to strangers* because *you never know in what form you will encounter an angel*. Thus fairness coupled with rational consistency is possibly the crux of Jain ethics without external policing.

Before it is too late, it is advantageous to judge actions that do not work, are unfair, inconsistent, and contradictory. Are humans born with the capacity to identify people who cheat during social exchanges? The ability to spot contradiction in normal behavior may come from the ability to recognize unusual perturbations in a pattern of behavior. For example, parents usually know when the child is hiding something or not telling the whole truth. It appears that toddlers can also spot problems from the mother's voice. Individuals who enter into social exchanges without determining whether the participant will cheat them out of the return favor will become exploited over time. Consequently, those who try not to let themselves become exploited during social exchanges are more likely to live long enough to reproduce to pass their genes to the next generation.

It is wishful to think that we get away with excuses. People rarely confront the willful liar or cheater. Not only the behavior

influences all of us, but it also has long-term consequences for the cheater as well as the society. We learn to be skeptical. Taking lies with a grain of salt does not make the experience palatable, but it postpones the moment of reckoning.

To be effective even the habitual liars do not always lie. Wishful lie, interspersed with occasional and well placed facts, is more advantageous. Accomplished liars have a fall-back position while keeping others guessing. Often bigger lies are likely to go unpunished, or even unquestioned. Most people can not very well grasp blatant contradictions – they begin to blame themselves *for not understanding the issues*. If exposed, big les like corporate swindles and Government propaganda are often treated leniently in the public opinions. They are rarely tried in the courts. People are much harsher in their judgment about welfare mothers.

Internet and rumors

Both relay information through interconnected nodes of the faithful and believers. In a network each useful node is connected to two or more nodes. A faithful node transfers or responds only to the information it receives. This is useful for e-mails and related uses of the cyberspace. However, fun, profit and trouble lies with the believers that add augment the message. It could be tagged on as an advertisement, it could be indistinguishable from the message or the mode of transfer, or it could be a virus or a worm. At one extreme, for making profit the unwanted messages attached to your internet rely on a return response rate of one in 500,000!

You become a useful node for spreading rumor if you respond or provide feedback. Reliability and speed of rumors and internet traffic is achieved because potentially all nodes in the network can be used for such purposes but a very small fraction is sufficient for the viability of the business. Insight into how

rumors and propaganda spread is useful for shaping-public opinions. *Astro-turfing* is a way to cover up (with synthetic grass) and give appearance of credibility by creating an environment where nothing else can take root. Religions, politicians, governments, and war-machines rely on the believers to pass on the interpretations of buzz-words and sound bites, and at the same time create wedge in the ranks of the opponents. Together it creates a fog of unreliable information. In this environment relevant facts can not take hold and issues get lost as contradictions and inconsistencies. See Chapter III-30 to III-32 for more.

Spotting contradictions. Television has made it easier to judge the public performance of VIPs and celebrities. Even in the non-fiction of news and documentaries it is amusing to watch people caught-up in a web of their own wishfulness. Watch twitches and gestures. Good cameraman and light conditions are remarkably effective in bringing "such people face to face with the viewers." Then there are Teflon-coated actors can sing without a feeling, presumably because they do not understand what they are saying.

Words of Mass Deception (WMD)

In a recent (2002) speech at the United Nations US Secretary of State Powell made a pitch to "show" that Iraq possesses the "weapons of Mass-destruction." Not only the logic of the argument was faulty, but the performance was unconvincing. By some counts well over 85% of the viewers were no persuaded. Contrast this to the pronouncements made by the partisans, talking-heads and opinion-makers sang the praise of the speech in chorus. The spin continued in spite of the fact that the UN

inspectors could fond no incriminating evidence before the war, or after the US occupation of Iraq.

Make a loan and lose a friend. Once a friend borrowed something. He did not return it, nor did I ever remind him. Slowly he drifted away. It was a reasonable price to pay because this person never asked me again for anything else.

One of my nephews asked me for some money. I gave it to him on the condition that he would return it. He took the money on my terms. Soon afterwards, he told many people that I wanted him to return the money, and that he had no intention of returning. After a couple of years when he did not return the first installment, I asked him if he realizes the consequences of what he did: First, he himself cannot ask me for more help. Second, the people whom he told about the incident will not trust him. Perhaps most importantly, others who may have wanted money from me now know that I only give a ***loan***. So I am spared the freeloaders.

On Truth

* The world is Lawful, hence redundant (Herbert A. Simon).
* Much more is at stake in the form of the implication of truth than truth itself.
* Knowing nothing is the reason to doubt that one knows everything.
* And how will you inquire, Socrates, into that which you know not? What will you put forth as the subject of inquiry? And if you find what you want, how will you ever know that this is what you did not know?
* Something seemingly self-evidently true to us does not guarantee that it ever was strictly, true (Robert Nozick)

* Indeed, religious conviction is not a matter of religious conviction for me (Robert Nozick)

* To know the correct and deep theory of truth's nature requires far more than the mere ability to state particular truths. It requires knowledge of the ultimate dependence relations, and of the ultimate explanatory and ontological factors. A theory of truth, therefore, arises closer to the end of inquiry than to its beginning. Do not be surprised that we have not reached it yet (Robert Nozick).

III-14. Social Influences of Non-violence

Man styles himself in the image of his gods. With such socially acceptable role models it is easy to see how some cultures have adopted judgmental, exploitative and vindictive code of conduct. Others have sustained and flourished with a concern for life rather than preoccupation with death. Humanist atheist and agnostic ideals are far more influential than any moral *a priori*.

Attributes and criteria of sustainability (Chapter I-13, I-14, II-3) are based on deeper understanding of interdependences for the survival needs. Survival is not encouraged by the mind-set that world was created for a chosen few. It has become increasingly clear that most animals do not resort to killing unless their own survival is threatened. Use of discourse backed by nonviolence has emerged as the preferred way to resolve conflicts. It requires plurality of thought to explore rational alternatives.

Killer primate?

In a set of experiments one 'Guard' was instructed by an authority figure to administer electric shock to a 'Prisoner.' The Guard did so repeatedly, even though the prisoner reacted dramatically to the shock. Unknown to the Guard, the prisoner was an actor in no danger because the button to administer the shock was not wired.

In another set of experiments with rhesus monkeys, an individual was trained to pull levers to obtain his food. When this monkey learnt that pulling lever caused pain to another monkey in an adjacent cage, the first monkey stopped pulling the lever and forfeited his daily meal.

Humans who believe that *they know better* or *are on the right side* are empowered to misuse power. Aggression and impulsive actions are integral and necessary part of nature. Such actions are generally used for defensive purposes. Most humans show such tendencies and most of our social interactions encourage it. Reconciliation and peace-making are integral part of normal primate behaviors. We may not necessarily be born to be good but through play children learn that it pays to be good, cooperative and conciliatory. It avoids conflict if exercised as defense. It may also avoid future conflicts if exercised after a conflict. Desire to avoid potential conflicts is also the basis for altruism. What is uncommon is the use of violence to resolve conflict. Conflicts may arise over the resources, but violent behaviors are encouraged by beliefs backed up by technologies. Violence of the 20th century encouraged the image of humans as *killer primate.* Violent behaviors of most primates do not come anywhere close which redeems other primates. Human primate may be taught to seek redemption through violence.

Modern war cries. The nonviolent world-views of most traditional societies, in particular in Ganga Valley, stands in contrast to the ideas of power and control that took hold father North-West of Mesopotamia (Volume II). These regions also developed ideas of dogmatic and judgmental divine. Doctrinal Truths often lead to violence because practice has to conform to support the theory. Inspiration from unquestionable and unknowable authority creates a model for unquestionable power and authority. Such empowerment is far too apparent from the practices of subjugation and exploitation through crusades, colonialism, imperialism, and globalization. Ideological war-cries for such encroachments include manifest-destiny, white-man's

burden, capitalism, privatization, demonization, humanization, flow of capital, Aid-Agency, World-Bank, International Monitory Fund, national interest, defense and security of *a way of life*. In all such cases the unsuspecting and weak pay the cost.

Devious means and nefarious motives may widespread in the jungle. But in the trenches for the *progress* the cost is paid by those that are far away and sometimes in the future. Less ominous sounding terms are invented to make the agenda palatable for the changing times. Repacking with increasing frequency diffuses the blame and makes accountability difficult. Even for culpability it is not easy to show specific cause and effect relationship. In some cases, remarkably convincing studies have come out decades later. But by that time as the older institutions are dismantled the perpetrators are no longer on the scene. Crooked political elite and fly-by-night institutions are neither democratic nor under democratic control. Such systems operate under the shadow but outside the control of our cherished institutions. With thinly guised propaganda they promote concentration of power for resource grab while avoiding culpability often by legal and political maneuvering.

Choking versus Bombing. To appreciate long term consequences of certain actions consider death by choking versus bombing. Then think of other inventive ways for everything in-between (see III-15). No matter how we package these end result is irreversible. That is violence. The characterization applies not only to acts that threaten the immediate physical survival of people (murder and slaughter), but all acts that threaten survival of the entity as individual and group. According to the *Pajatta* criteria (Vol. 1) for sustainability food and safety are as important as the resources of environment, language and culture to reserve the web of life.

Web of life. An individual lives within the web of life. Sustainable co-existence within such an interdependent web requires nonviolent means of conflict resolution that curtail irreversible actions. Umasvami in **Tatvarth Sutr** (ca. 300 CE) epitomized the idea of the public commons as:

Parasparo-upa-graho jivanam

Living beings render service to one another. Put another way, the good of one is in the good of all, and the good of all is in the good of one. Its tangibility is also holds for the converse, i.e. threat to one is a threat to all. It is not the conduct based on moral authority, but it is the conduct based on concerns to preserve *quality of life* with full recognition of the interdependences that sustain the web of life.

Approach to reason. About 100 years ago, Mahatma Gandhi and many others chose to challenge the fundamental unfairness of the British presence in India and elsewhere. The method of dialog and persuasion offered a rational alternative that even the British could understand. He moved forward the argument that their methods supported by their culture of violence at best postpones the day of reckoning. Probably the British were not as merciless as the French were in slaughtering the educated before leaving Algeria. However as a historical footnote for those who have a more charitable view of the Colonial British, none of the British ex-colonies have emerged as successful democracies.

As the powerful nations continue to exercise might as the right, there is increasing appreciation of appeal-to-reason for conflict resolution. For emphasizing nonviolent means for conflict resolution Mahatma Gandhi has been recognized by Time magazine as one of the three most influential persons of the twentieth century. Although Gandhi is not on the list of *The 100*

Most Influential Persons (John Hart, 1972) of all times in human history Mahaveer is recognized so. The truths of *live, let live and thrive* is rooted in biological survival instincts. Both Mahaveer and Gandhi also noted the futility of being possessed by possessions (*a-parigrah*). It is now the cornerstone of eco-preservation and sustainable consumption and life-style based on renewable resources. Violence against ideas and feelings requires respect for ideas and actions of others as a way to consider useful possibilities and explore alternatives for successful behavior.

Monks who came to his childhood home for food sensitized Mahatma Gandhi to such concerns. Also, after his return from South Africa, Raichand Mehta (1891-1892) reaffirmed Gandhi's faith in nonviolence with a more activist interpretation that struck a deeper chord. While people know that *violence begets violence,* it requires great insight to see that *an eye for an eye leaves the whole world blind*.

In the context of shared understanding by leaving lines of communication open, consider the vision of Berners-Lee, the inventor of www or the World-Wide Web: *Hope in life comes from the interconnections among all the people in the world. We believe that if all work for what we think individually is good, then we as a whole will achieve more power, more understanding, and more harmony as we continue the journey. We don't find the individual being subjugated by the whole. We don't find the needs of the whole being subjugated by the increasing power of an individual. But we might see more understanding in the struggles between these extremes. We don't expect the system to eventually become perfect. But we feel better and better about it. We find the journey more and more exciting, but we don't expect it to end. Should we then feel that we are getting smarter and smarter, and more and more in control of nature, as we evolve? Not really. Just better connected - connected into a better shape. The experience of seeing the*

Web take off by the grassroots effort of thousands gives me tremendous hope that if we the individual will, we can collectively make of our world what we want.

In closing, interdependences sustain the web of life just as suitably configured parts sustain the whole. The converse also holds: The whole may provide a particular identity to the parts, but the whole does not sustain the parts. Ideologies do neither. Plurality and individual diversity is necessary to find niches for survival and solutions for emerging challenges. Our more cherished institutions make more room for such expressions in virtually all areas of collective endeavors ranging from the political democracy to free flow of information and ideas. Resulting independence encourages expression of individual potential.

III-15. Greed and Grab

Mahendra Kumar Jain, Quarterly Review of Biology 73: 329-332, 1998: Greed and Grab: Many Are Called Yet Few Are Chosen. Review of: **Guns, Germs and Steel: The Fates of Human Societies**, *By Jared Diamond. New York: W. W. Norton & Co. 1997.*

Professor Diamond has given us another perceptive book with broad implications. In a thought-provoking way, with a human touch and intuitive continuity, he discerns patterns of human and technological evolution since the end of the last Ice-Age. The arguments, based on facts established by both radio-dating and genetic methods, flow with celerity and ease. The book draws from many disciplines with suggestions for further reading, yet it transcends academic limitations.

The premise of the book, "Why many are called, yet few are chosen," explores biological variables as the basis for the development of technologies. Important among the factors that shaped the evolution of complex human societies and their technological innovations were the environmental and biological constraints. Effects of broader patterns of interactions of different human groups with each other, and with plant and animal species resulting in domestication and depletions are identified and judged.

Primarily, the book identifies the expansion trajectory of a group of Eurasians, whose descendants now dominate the consumption of virtually all non-renewable resources at a per capita rate that is 30 to 100 times higher than that by the other less-developed 80% of the world population. Also, computed as

pressure on resources, the population increase in the developed countries is more than 10-times higher. Clearly this is unsustainable, and its inevitable long-term impact can only be guessed at. Since consumption and technological developments have gone hand-in-hand, what can we learn from Diamond's inquiry into the course of development of our technological civilization during the last 12,000 years?

At a fundamental level, as with any important lesson from the past, the arguments in the book bear on broader contemporary issues. A more provocative and perhaps compelling case emerges if one takes the liberty of extending to our present situation these patterns of behavior from the past that Diamond has identified. From this point of view, resource constraints and geopolitical borders that shape pressing problems of development and survival in the form of economic and market forces become almost invisible. When selectively applied in the guises of various rationalizations, these forces lead to subjugation and *de facto* genocide.

Diamond points out that until about the beginning of the 16th century, people from areas north and west of the Alps contributed little technology of significance; they were mainly recipients of developments made in the regions bordered by Ethiopia, India, China, and the shores of the Caspian and Eastern Mediterranean sea. Examples of such basic technologies include domestication of plants and animals, coupled with the use of the plough and the wheel to harness animal power, permitting the transition from hunter to herder and from gatherer to farmer. Soon after, by the fifth millennium B. C., in these areas urbanization, social and administrative organizations, metallurgy, written language and mathematics began developing as a necessary consequence. Unique factors contributing to this burst

of innovation so soon after the end of the Ice Age included a fertile land mass with a climate favorable for agriculture, generous availability of a genetic stock of seeds and animals suitable for domestication, and human migratory patterns that promoted continuous development through exchange of materials, ideas and experiences. Not surprisingly, there are very few other instances of independent or parallel developments because such a confluence of factors was not to be found elsewhere at that time, which only attests to the critically fundamental role such factors, played in the initial surge of innovations.

It is puzzling that many of the technological innovations from East turned into means of exploitation in the West. The Steel from South India was used by the Assyrians to make Damascus sword, and it was later turned by Romans to arm with short swords their colonial armies of peasants. Moral and ethical ideas have been turned into War cries. The black-powder technology from China was turned into guns and cannons. Technology of paper in combination with printing was first used to proselytize the masses.

Innovations from the East, such as horses and carts, were brought to central and western Mediterranean shores by Persian invaders. Phoenicians introduced ships to this region. Possibly attracted by riches and knowledge, and inspired to eliminate once and for all the threat of the Persian Empire to Greece, the army of Alexander swept through Central Asia to the borders of India. These events accelerated a westward transfer of technologies, funneled through Greece that transformed the hunters of Europe into organized seafaring societies during the last two millennia. By the middle of the current millennium, this transfer also

resulted in the translation and re-interpretation of the compilations and libraries, accumulated by Arabs at the beginning of the millennium, that fell into the hands of Christian monks and European universities. Without this interpretation, and grand synthesis of the events spanning the last three millennia, the achievements of the ancient Greek world, to which modern European civilization owes its roots, stand in isolation as a discontinuity.

To put it simply, as is often appreciated by those engaged in intellectual pursuits and practical innovations, useful technologies developed cumulatively, though not successively. Simpler technologies beget more complex ones, and innovations rarely thrive in isolation. Collectively developed technologies create value, and markets make the intellectual property available to the society at large. However, narrow and stifling profit-oriented definitions of innovation as a matter of course deny the value of incremental motivations from the parallel technologies and empirical observations. Along these lines, the damage to the free exchange of ideas and innovations from the recent spate of patents on DNA sequences is just beginning to be apparent.

The arguments in the book for the development and transfer of technologies have broad implications. Although not the main theme of the book, it does squarely demolish theories perpetuated in terms of the genetic (Bell-Curve), philosophical (Greek), or cultural (Christian, Confucian, Brahminical) notions of superiority of a sub-group as the basis for technological progress. Although such arguments have never withstood critical scrutiny (Gould, 1996), such self-serving sound-bites promoting mismeasures of man have been used as ploys for indoctrinating the soldiers and workers needed to maintain and mobilize the

structures for the subjugation of others, and also to lower the morale of the opposition to better support a colonial mind-set.

Unquestionably, the human interventions that lead to large-scale technological innovation and implementation not only unleash forces of greed and grab, but also lead to biological catastrophes and environmental disasters. During the last 500 years, the Europeans, physically armed with "guns, germs and steel," and blessed with missionary zeal under the garbs of various rationalizations, have moved far beyond their borders to occupy three other continents, both controlling resources, and subjecting innocents to genocide and cultural propaganda as well. The move has motivated technologies that support the war efforts and an expansionist agenda, *albeit* other innovations follow incidentally. Following in the footsteps of Romans and Crusaders, the colonial notion of power still persists. As global imperialism it relies on the knowledge, labor and resources of others assimilated by missionary, mercenary and market forces. This pattern of unprecedented exploitation continues as "progress" and is defined by aggression, control and subjugation. From this point of view, rationales for protracted geopolitical and economic policies perpetuated in the second half of this century, for example, with regard to the control of petroleum and mineral resources, are not fundamentally different from those that motivated "winning the American West" by destruction of the food-supply (buffalo herds) and infection of the native populations by sending them blankets pre-used by smallpox patients. In a short period the guns and germs of the U. S. Whites destroyed 95% of the native North American population of over 20 million. They also eliminated the diversity and genetic viability of these human populations, as well as a large number of other species deemed necessary for progress at the time. All this

was done in the name of bringing civilization, religion and culture to the barbarians, although the methods, motives and point of view now appear to be far more sinister.

In many cases, given the late transition from a hunter-gatherer society to one of farming and production, there has not been enough time to develop less violent means for conflict resolution. In this sense, the European grab for land and power by exploiting serendipitous accumulations of useful technologies at the right time is not unique in world history. Armed with divine blessings, Mongols, Incas, and the like in their own ways also terrified large groups of people for the benefit of a few who over-consumed resources. Even in this century, the colonial powers, Nazis, Soviets and Chinese with their own agendas have subjected large populations to plunder and murder. What are particularly threatening about this latest march of history that we are being swept along with are the unprecedented rate of dissipation of international non-renewable resources and the degradation of the global environment in order to maintain an unsustainable way of life. Ominously, a growing percentage of the world population is being subjected to the onslaught of technologies controlled by the few, without being even aware of the consequences. Of course, once the problem is recognized in earnest, the hope is that solutions will be found. What is the cost? Coming to an agreement and striking a balance is a collective task.

Like evolution, although on a somewhat different time scale, democratic and market approaches maximize the potential of most individuals in a group, and thus increase the chances of success of a sub-group. Technologies help in fulfilling the promise of this premise by permitting more people to perform skilled tasks. For example, a considerable amount of skill is needed to use a bow and arrow. Guns, requiring far less skill,

turn more people into effective hunters, and possibly indiscriminate killers. Like evolution, technological, market and democratic processes also lead to distortions and dead-ends. So a key question emerges: what ends are to be achieved by the powerful means at hand? Also, can individuals and sub-groups be protected from the meaner edge of such tools, methods and institutions, which are increasingly more powerful, distant and broader in scope?

If cleverly used, established human-friendly technologies make up for talent. Also, material progress promoted by technologies helps in controlling the drudgeries of life for most people. One may wonder what factors contributed toward the rapid development of technologies led by the Europeans during the last 500 years, and what we can learn from this experience. Development of new energy sources and machines have opened new territories, improved productivity, and ostensibly freed a greater fraction of the population for innovations. The ideal of democracy extends the promise of such prosperity to "all," yet a lack of political will promotes unsustainable consumption patterns. The failure of the self-regulatory aspects of the market forces is, for example, obvious in the experience of the last 50 years with tobacco, asbestos, DDT, and the arms industry. Other time-bombs with global implications are ticking away in the form of excessive use of fossil fuel and antibiotics. While for-profit industries transfer social costs to the society-at-large, the environmental costs are being increasingly transferred far away from the consuming nations.

To promote consumption mechanisms have evolved to control marketing and distribution, while the social and environmental costs of over-consumption are transferred across international boundaries without benefit of the checks that a

functional democracy can implement internally. As a result, the reality of the damaging consequences of open international markets is virtually dissociated from concerns for the international community. With the realization of this fundamental contradiction, the forces of greed extract value by exploiting local in-equilibrium, rather than by creating value in harmony with broader interests. Treatments prescribed by the international agencies for the economic ills are often formulated by banks and institutions with an indoctrinated faith in their efficacy, which may be as misplaced as that attributed to the usefulness of blankets pre-used by smallpox patients. It is not surprising that often such international cure-alls are not favorably received.

In short, the rational ideals of democracy and markets can and do degenerate at times into a schizophrenic world-view at dissonance and in-equilibrium with itself. The reasons for this are quite fundamental: democratic solutions within national boundaries cannot control international and global exploitation by the consumer markets.

From this remarkable inquiry by Jared Diamond emerges a lesson, which, without blaming the victim, interprets long-term developmental events and patterns in terms of the biological, environmental, and resource variables. Many were "killed, infected or driven off" for the technological progress claimed by the few. As we sit back, it is reasonable to ask, can short-term market forces governed by instincts of grab and greed be trusted to promote the wide-spread use of technologies, especially the ones that impact all of us by promoting an unsustainable consumption behavior? Or is it time to more actively balance the interests of all? Obviously, an acceptable answer must have something to do with well-being and survival in the broad

biological context of live and thrive by letting others live and thrive; i.e., with little reliance on germs, guns and grab.

In writing this book-review I have greatly benefited from insights and comments from Professors Otto Berg, Prasad Dhurjati, John Wriston, and from numerous discussions with others who also tolerated my provocative style.

Gould, S. J. 1996. The Mismeasures of Man, W. W. Norton & Co., New York. pp. 444.

III-16. Conduct with Consistency

A relationship between principles and conduct is often invoked to guide personal growth and safeguard social behaviors. Such concerns have occupied virtually all societies ever since settlements began to appear 10,000 years ago. Different cultures have devised wide ranging motives. Once I asserted that I do not believe in God. My niece Preeti, then 13 years old, asked, "If there is no fear of God, why can't we do anything we want?" Fortunately, during the next five years she grew-out of mind set. She learnt to be more afraid of inconsistencies and contradictions of her own actions that she could not justify to herself.

Virtually all societies seek a consistent way of doing things. Consistency can be extrapolated to predict future behaviors on which we can build our expectations. Here wisdom is *do not do to others what you do not want to be done to you*. Validity of sustained behaviors can be evaluated on the basis of their consequences. In consequence evaluations a cases the cause is not always obvious, nor a particular outcome is absolutely assured by a particular behavior.

Consistency of actions results in directed efforts that bear consequences. Random acts do not add up to anything thing of significance. The idea of usable knowledge through human efforts has resulted in virtually everything we have come to rely. It is further encouraged through virtually all fields of open inquiry including education, technologies and sciences.

III-17. An Activist Perspective

First they ignore you. Then they laugh at you. Then they fight you. Then you win.

- Mohandas K. Gandhi

What is common between Einstein and Gandhi? In 1925 both signed a document against forcing men into Military service. At the end of the century both were among the three judged to be most influential persons of the 20th century. Albert Einstein is remembered for developing the current understanding of matter and energy in relation to space and time. In the pursuit of his belief in the superiority of his strain of humans (ill defined as race), Adolf Hitler annihilated 100 million people within a decade. Even in his life time Mohandas Gandhi was called Mahatma, the great soul, for emphasizing conflict resolution through non-violent behaviors. He argued against arbitrary principles and beliefs.

Paradoxically, based on their individual beliefs, each of the three above followed a *rational* course of action to address a problem recognized by many. In each case the behavior was contrary to the prevailing belief system. Clearly, their efforts were not directed towards self-goals, nor was their vision accomplished in their lifetime. Yet they continue to influence choices available to virtually all of us.

As an activist thinker Gandhi used to talk disparagingly of dreaming of systems so perfect that no one will need to be

good. In 2001 Nelson Mandela noted: *At a time when Freud was liberating sex, Gandhi was reining it in; when Marx was pitting worker against capitalist, Gandhi was reconciling them; when the dominant European thought had dropped God and Soul out of the social reckoning, he was centralizing society in God and soul; at a time when the colonized had ceased to think and control, he dared to think and control; and when the ideologies of the colonized had virtually disappeared, he revived then and empowered them with a potency that liberated and redeemed*.

Understanding human behaviors. Wasted effort is also wasted resource. Consequential actions also impact others. Direct causality is difficult to establish in a multivariate and uncertain world. Yet most recognize causal, evidential, and symbolic relationships between the action and consequences. Charting a rational course of actions poses the challenge of recognizing deeper potentiality while grounding the vision in reality.

Self-reference is good yard stick. Chances of success improve through practice of doing what you preach. By avoiding irreversible action we get a second chance. As we learn from feedback, prudence for decision-making dictates avoiding traps of paradoxes and contradictory behaviors. On the other hand deontological a priori (moral, ethical and legal principles and values) is often a matter of arbitrary interpretation that leaves considerable gap between theory and practice.

Language and communication have become integral part of human behaviors. So much so that most of our learning and experiences are now language based. Communication abilities are not unique to humans. Humans excel in behaviors based on abilities to communicate, share thought, and pass the experience for the future. Word interactions also help individuals enhance their potential and compensate for weaknesses. Language

abilities are beginning to compete with other individual attributes of nurture and nurture.

We interact in commonsense way with the imminent and the immediate. The tit-for-tat tendency may be an instinctive behavior but it is also captured by virtually all models of successful group behaviors. Rationality of human group behavior extends to initially treating one's fellow being well with benefit of doubt. Reciprocation may follow on subsequent encounters.

The observed and phenomenal worlds may be indifferent, but at least humans are not indifferent to the interactions with such worlds. The uncommon sense of all animal behaviors lies in way we perceive patterns where none may be obvious. This is how we learn, develop and share information to facilitate future actions with lesser reliance on trial and error. To extract information we also appeal to imagination, transcendence and potentiality Operational rationality of individual and group behaviors lies in the actualization of reality and its potential. Within this framework, damage control is a part of consequence evaluation.

Future is touched by the activist approaches of the past, and others are touched by the influential actions. Tools, agriculture, and symbolic manipulation of language are some of the cherished developments of such collective heritage. So are the practices that perpetuate blind faith, exploitation, and means of warfare. As a lesson of history, rational behavior does not emerge from any particular development. But those which contribute are considered desirable for all times to come.

Practice based validity contributes to longevity. Through literature, peer interactions, and carrot-and-stick approaches we nurture abilities to identify the consequential. Instrumental and serviceable truths emerge as ways to minimize regrets by

avoiding contradictions and irreversible acts. In the process all are touched by the collective vision as more individuals recognize their potential to incrementally become what they never thought was likely.

Individual behaviors of all shades are based on internal models. Such models rely less on the grand universals or inherited traits, and more on what we learn from contingent and local contexts. It is easier said than to figure out how it happens. Both by rational and irrational variants of human behaviors appear to follow the same pattern, if not the trajectory. What do we do when things go wrong? How do we recognize a rational approach? Can we follow a democratic model to recognize or identify rational behaviors? When do we recognize that things have gone wrong? Why and when do things go wrong? It works out if we are free to make decisions, follow through, and have to live with the consequences.

Emotions rule our sensitivity and sensibility. Consider the fascination of the news and entertainment media with morbidity. Most remain unconcerned unless victimized personally. From the comfort of our homes, we think little about wiping-out the space-aliens on the silver screen. Before it was not politically corrected most reacted with the same insensitivity in the history class about decimation of millions of natives of the Americas and Africa. Responses were not very different to deaths from nazi gas chambers, atomic holocaust (Hiroshima and Nagasaki), from poisons (Kurds), from industrial accident (Bhopal), or from the smashing of an airplane into Twin-Towers (Manhattan) or Pentagon. Different people may have been touched differently, but most did little.

Not many are shaken even when they see the imminent. Very few smokers, alcoholics, gun-slingers and drug-users seem to worry about what these do to the quality of their own lives, let alone of the others. Do we understand why we do or do not do certain things even when the outcome is more or less certain? When and how do we react to unfolding events? When do tragic events become a tragedy?

Why do we hold back?. People do what they have to do. We accept the consequences as the best of the possible real worlds. Risk taking is a factor in the realization of human potential. But few take risk even the consequences of not taking risk are evident. Depending on what motivates us and what we desire we make principles to justify our actions. With such ad hoc deontological a priori, consequences are evaluated as narrow utilitarian after-thought. We know too little to consider the interests of everyone to arrive at a utilitarian or deontological utopia. The best, most effective, or most efficient actions are not necessarily rooted in rational conception of goals or means.

Truth accumulates baggage. Truth has been called as the essence, spirit, or soul. As commonly conceived, truth is a static term for a facet of reality. It may even be a hypothetical view of reality that barely touches upon the potential. The downside emerges as the belief in a hypothetical version degenerates into true-belief and faith. It is hard to get rid of such liabilities of truth. Beyond serviceability, qualifications like coherence and correspondence do not peel truth away from ad hoc and a priori of one brand or another. Apparently, the problem stems from the fact that we still do not have a theory of truth as noted by Robert Nozick in *Invariances* (2001): *To know the correct and deep theory of truth's nature requires far more than the mere ability to state particular truths. It requires knowledge of the ultimate dependence relations, and of the*

ultimate explanatory and ontological factors. A theory of truth, therefore, arises closer to the end of inquiry than to its beginning. Do not be surprised that we have not reached it yet.

Neither do we a theory of medicine or of its practice. In all such cases we do not have the ultimate dependence relations. We are unlikely to know when to expect these to arrive.

There are far too many invented truths, and more can be made to order. For our purposes we often confuse truth with facts of information and other particulars (Rothman and Sudarshan, 1998). Even if we assume that truth is a useful version of actuality, the multidimensionality of phenomenal reality is unlikely to be compressed into a null point where the various valid assertions about the world intersect. Similarly, without compromising the essential character of reality, its hierarchical nature cannot be compressed into a singularity of truth – not even as an extrapolation. Maybe the universal or basic truth, like omniscience, is also one of those unattainable ideals that contradict reality.

Omniscience contradicts reality. Consider the liar's paradox. Would you trust a person who asserts *I always lie*? Clearly, no matter how much effort one puts into the analysis of such a self-referential statement, its truth-value cannot be established. Omniscience is also such a paradox because it means little beyond what it is said to be. Beyond that it does nothing and means nothing. Like the philosopher's stone and perpetual machines such wishful constructs convey little that is useful. Very few habits of mind can reinforce inflexibility of behavior and attitudes to the extent that reliance on omniscience does. Omniscience by omnipotence fosters and then thrives in an environment of ignorance of fear.

The lore is also implicit in many other all-encompassing constructs for "unification," arguments for the civilizing influence of certain behaviors, survival of the fittest, manifest destiny, wars to end all wars, and the theory of everything. No wonder Plato's recipe (Republic), for authoritarian rule of the *wise* few over the *stupid* multitude, has inspired many despots. Here is Plato's recipe for the Perfect State: "*… best of either sex should be united with the best as often, and the inferior with the inferior as seldom as possible, and .. they should rear the offspring of the one sort of union, but not the other, if the flock is to be maintained in first-rate condition. Now these goings on must be a secret which the rulers only know, or these will be a further danger of … rebellion*." Hitler took this to his heart.

As caricatured in George Orwell's *1984*, whosoever comes into authority grabs the garb of the Wise. Such drum beating invariably has nefarious agendas against which we need a constant vigilance. Yet we fall for the pretender of know-all and tyrannies of half-baked ideas. Even if there is no enduring laws of history, the lesson is that all societies are far from being models of perfection. Ideologies have emerged as recipe for tyranny. As humans get propelled uncontrollably in the whirlpool of such influences, to protect self-interests their minds also regress for self-preservation.

Episodic instrumental in the shared circumstantial. Reactions and revolutions for social upheavals are desirable only if feudalism is not replaced by other forms of tyrannies, including the tyranny of a majority. Reliability of a call for action increases if predicated on objective reality. Traditionally, anecdotes and parables capture episodic circumstances as playful experience as the essence of reality. The process is vicarious. But we learn to explore and deal with episodes as make-believes from virtual worlds. Like the literary narratives, the entertain and news media

also build on the episodic changes. In all such cases, without a suitable narrator the burden of continuity of thought is on the consumer. Possibly for such reasons these devices have become messages for products.

Interaction with the episodic requires analysis and synthesis from the parts and relations. It is the way do inquiry in arts, philosophies, technologies, and the sciences. These are successful so long as there is a clear recognition that reality is not an arbitrary construct no matter how we represent it. As we pick and choose for the serviceable truths, our interest in the underlying reality becomes circumstantial. Such representations of circumstantial reality are always with us. We reaffirm their staying power every time we draw on them and share. If we are not careful, they encumber us. Without constant scrutiny over period of time, even the most useful representations and interpretations become listless intellectual property at best. For example, sound bites and memes degenerate into make-beliefs disconnected at the core of rituals.

Synthesis from beliefs. Instrumentality and serviceability of circumstantial representations of reality lies in the observer participation. Otherwise, such representations are indistinguishable from mindless propaganda based on fiction or faith. Impossibilities that contradict, but mimic the experience, are initially included *ad hoc* as in creationism, mysticism, and omniscience. Unless impeded through circumstances of nurture, such make-beliefs stay with us the rest of our lives. The unformulated models that interfere with the individual perception of reality behind awareness (*yoga chitra vritti nirodh* as noted by Patanjali ca. 450 AD) are ultimately weeded out through shared experience or contemplation. However, certainty emerges only in stages as specific doubts are resolved one at a time.

Shared circumstantial and potential are explored through narratives such as anecdotes, parables, poetry and epics. Utility of what is communicated lies not necessarily in the content, but in the exploration of effective alternatives with varying degrees of doubt and certainty. Narratives in effect celebrate shared perceptions while making the alternatives accessible to an individual for real-time use. It is also the purpose of play before it becomes a game. In such dealings with diverse level and range of emotions, the player develops constructs to deal with the circumstantial.

Playful interactions are significant for breaking new ground for virtually all representations. Playful exploration and interactions are encouraged at the leading and the lagging edges of science. At the lagging edge one explores implications. At the leading edge one develops thoughts about the workings of a specific and limited part of the universe. These are encoded in models with as many assumptions as necessary. In between one fills the information gaps to have confidence in the beliefs. Such analytical reductions have been remarkably successful in describing parts of the universe. In fact, predictive power of the practice-based beliefs is the basis of all rational decision-making. **Beliefs to ensure that *love will stay true to itself.*** Philosophers search for reasons to support their beliefs and construct arguments against other views. The rational core of European philosophy is dominated by the idea of *justified true belief.* This is the basis for thought applied as the explanatory power for reasoning to justify goals, desires, means and ends. Theologies have varyingly drawn upon such models, often with more emphasis on belief in the a priori than that can ever be justified by practice.

The cognitive merit of stating assumptions was widely recognized in several cultures around 600 BCE. Some versions placed a high premium on the formulation of theories. These came to North Europe through Euclid, and in 16th century it evolved as the Cartesian rationality. Descartes' rationalism surmised that we should trust the self-evident backed up by reasons. Yet the basis for this belief is grounded in ever-so-elusive omniscience. The overall justification has elements of belief in prior knowledge, reliable facts, and reliance on certain universals. So what comes first in reasoning: belief or justification? An axiom-based treats search as an after the fact analysis. It deals with the past in the form of justifications that may often be built, knowingly or unknowingly, into the axioms, assumptions, and practice. Recognition of such limitations has opened ways to scrutinize the *worlds* of reason and criteria from within and without.

Ground for reason. Over the last few millennia numerous attempts have been made to arrive at *justified true beliefs* based on reasons to eliminate vagaries of chance, empiricism of whim, and the authority of grandfather clauses. Yet it is not easy to say what constitutes good reason for believing something. As individuals we perceive through conceptual schemes that guide and mislead us in real-time decision making. Through reasoning we actively interact with the awareness of events and happenings.

Reason is also an instrument for defining the goal as well for attaining the goal. Reasonable goals may be attainable goals but are not necessarily worth having. Thus they differ from rational goals. Reasons themselves have been used as evidence for what they are reason for. This is often the justification for the belief that reasons with connection to all relevant facts about the world must guide action, at least for the consequential actions.

What seems evident at the surface does not necessarily impart reality. Similes, metaphors, and the *bitters and yellows* of alchemists stay in touch with reality, but hardly anybody would call them real. In the same vein, wars give meaning to hollow lives and meaningless existence.

Cognizant of such difficulties, reason is grounded in induction (Hume) from generalization such as *all ravens are black*. This is valid only so far as the conclusion works. Such empirical validation is also inherent in the search for the *domain of reason* (Kant). This has evolved into non-deductive (statistical) probability of various forms. Such approaches have metamorphosed into the so-called path-based approaches for scientific knowledge based on the outcome of multiple events. Here knowledge is a way to intuit facts through reason. Inferences are used to construct empirical reality of single events but only in hypothetical terms. Consider the fact: People are more likely to be victims of violence if they keep guns around their homes. It does not mean that *all gun owners are victims of violence*, or *all victims of violence own guns*. Yet the probability of being a victim of violence increases if there are guns around.

Prisoner's dilemma

This widely quoted invented game has been misinterpreted as "paradox of rationality." A prosecutor, with insufficient evidence to charge either one, separately offers the same deal to both the prisoners: If only one of them confesses he gets 20 years and the other goes free. If both confess they get 10 years each. Based on the weak and circumstantial evidence that the prosecutor has, if neither party confessed they could be sentenced to only 2 years each. The pay-off table (A,B) for possible prison terms for A and B is:

		B confesses	
		No	*Yes*
A confesses	*No*	2,2	0,20
	Yes	20,0	10,10

What one says has consequences for the other, and not confessing is to the advantage of both. However without knowing what the other said, the only rational course for both is to confess.

For an appreciation of the choices and hidden assumptions consider a related game. Two players are offered a choice of either taking $100 from a pot for themselves or to give $200 to the other player:

	B	*takes*	*gives*
A takes		100,100	300,0
gives		0,300	200,200

Without any other information the rational choice for each is to take $100. Otherwise, if one gives $200 the other may increase pay-off by keeping $100.

Altruism and reciprocal cooperation emerges if A and B play repeatedly. If they cooperate each gives 200 to the other and both pocket 200 in each play. If a player decides to cheat and the other reciprocates by retaliation the stream of pay off for the cheater changes to 200, 300, 100, 100 … Self-policing works if cheating does not pay! How about the religious charities with ruse of other-worldly payoff?

Deontological a priori of reason and cause. As a comforting guide, certain kinds of actions are considered inherently right or wrong. We often assume that all action choices should be morally, ethically and legally defensible. Such pure deontological *rights* and *wrongs* without concern for consequences are virtually nonexistent. No where is it backed up by practice.

Moral precepts from omniscience are backed up by grace and judgment. With faith in place the responsibility for consequences is placed in the choice of action, and the decision is disassociated from the individual. In the Confucian approach the *a priori* comes from the ancestors and the emperor. Such faith-based decision still continue to influence the lives of many. Even in 21st century, in some are stoned to death, loose limbs, or raped as punishment under Islamic moral and legal code as in Saudi Kingdom.

Modern law and justice systems have made the causality connection more direct. Consider the consequences of keeping *undesirables* off the streets. Even if some are stopped from doing wrong, locking away petty criminals tends to make them more determined. Such threats are certainly not effective in stopping the political corruption, accounting manipulations, and corporate wrongdoings. The white collar crimes cause far greater damage to innocent individuals while shaking confidence in institutions of organized society.

Rationality Rooted in Conceptual Schemes

To perceive worlds through conceptual schemes, we use knowledge to develop principles as standards and benchmarks of rationality. Most of our social activities are driven by principles thrust upon us. Specific principles guide us through learning chemistry, making marriages work, negotiating mergers of corporations, making pronouncements about the systems of education, government, and the world. Whether or not we understand, let alone learn to reason with such principles, as social beings we all learn to mimic the expected responses. In fact, in some cases the chasm can be so deep that the correspondence between the principle-based social expectations and personal

beliefs is unbridgeable. Principles are not immutable. They change with time as we learn more about the system, at other times they have to be pushed out by force, if necessary.

At the very first level certain principles provide a road map for steering through the chores of living. Consider the utility of the following principles of behavior:

(a) Intellectual principles permit acceptable decisions as they constrain and restrain personal factors.

(b) Interpersonal principles assure adherence in the face of temptations and inducements. By reducing distractions, this increases the range of interactions and cooperation with others.

(c) Personal principles define one's physical being and intellectual identity. Self-control to overcome temptations is an important part of personal growth. Such commitments make certain decisions easier.

(d) Sometimes principles come to symbolize the standing and meaning of a person and society. It is known to induce irrational actions.

(e) Principles are also teleological devices that transmit evidential support and probability. Through give-and-take, they transmit utility from some actions to others.

It is worth examining what motivates us to justify our actions in terms of principles that we did not formulate ourselves. Possibly, at some stage principles become dissociated from reality with role playing and peer pressure as the judge. How do people take responsibility for their actions based on the principles they did not set? When do they try to overthrow principles? Would the leaders sponsor a war if they knew that they would at the front line? Does it make a difference if the war involves: Islamist mercenaries, or Christian missionaries, or Undercover operations

of Superpowers, or Corporate raids? Would you be able to justify the difference?

Selective use of facts. Without clear recognition that we do not necessarily know all the facts about the world, rationalizations based on selected facts become vehicles for bias justified as beliefs. Such charges against the *standard* of rationality are not to be construed as bias against the *process* of rationality. Biases are often built into the attempts to develop a theory of rational action. For example, game theory is merely a model of a small part of the world in which certain human actions have defined outcome. It is evaluated only as winning or losing. It is only pragmatic that the fluid character of bounded, justified and veridical beliefs, if that is what theories and laws supported by principles aspire for, can be an aid in harnessing facts. Beyond that it is more desirable to shape reason with inferences rooted in emerging reality and acknowledge the liabilities built in the process.

Rationality of beliefs involves credibility of the reason and goal coupled with credibility of the source. The lesson is to remain cognizant of liabilities inherent in the assumptions, method, and inference and other products of reason (actions, behaviors). Even with this recognition sooner or later we begin to suffer from the out-of-context beliefs assured to be true. Beliefs are tied to the context with which incompatible possibilities are excluded or deemed unworthy of consideration. As the belief algorithms deteriorate further, the rituals take over. Many decisions are carried out without attention to the context, let alone thought of the consequences or risk-cost assessment. The casualty of this metamorphosis is reason itself.

III-18. Causality: End or Means to Reality

Problem of assigning causality to an outcome, let alone the distant consequences, is ever present. Our collective and evolutionary memory has always served the vicarious purpose of making one aware of the dangers and opportunities in the world without really making us aware of even the identifiable variables. All this happens without explicit awareness of reasons and with only a vague inkling of a pattern that we may take for causality. So the challenge is how to identify variables and causality so as to predict outcome and consequences.

Widespread realization that actions have consequences is at least 8000 years old. Almost all over the world one expresses it as *what you sow is what you reap*. Such empirical ideas of causality based on outcomes are part of human evolution. They permeate virtually all aspects of human behaviors. Such formulations (wisdom) help us perceive reality as a hierarchy of characteristic structures, interactions, and relations. Sooner or later we learn that these can be independently manipulated. Such insights into the phenomenal world come from accumulated observations, evidence, and methods of reasoning. For example a useful construct, of say the course of an incoming storm, helps us peer into its future course.

Value created by such reality-based models have contributed far more towards general well- being than virtually any other human endeavor. By creating value, likes of Ampere, Pasteur and Einstein have done more to improve the human condition than any saint or martyr. Jawaharlal Nehru noted:

"*It is science alone that can solve the problems of hunger and poverty, of insanitation and illiteracy, of superstition and deadening*

custom and tradition, of vast resources running to waste, of a rich country inhabited by starving people. .... Who indeed could afford to ignore science today? At every turn we have to seek its aid. .... The future belongs to science and those who make friends with science."

A simple statistical result would suffice to make the point. Until about 1800 AD the average life expectancy of a newborn was less than 30 years throughout the world and had changed little during the preceding 2000 years at least. It has not changed in countries where newer empirical measures have not arrived. Changes in nutrition, public hygiene, availability of antibiotics, and emergency care have raised life expectancy to over 60 years in most parts of the world.

Outcome versus consequences. Direct causality is difficult to establish in a multivariate and uncertain world. It prevents prediction of outcome, and assessment of the consequences. It is the main reason to keep the incremental search grounded in reality, and keep the inferences tentative until falsified.

Logic does not establish content or context. Outcomes can be deduced if all parts and relations are known. In such reasoning logical operators track the real world relations between the parts of the real content and context. Only in such a setting logic operators and their mathematical counterparts guide reason towards valid outcome by deduction. Four (*and, or, not, equal*) operators form the basis for all relations in mathematics. More complex operations (such as either/or, neither/nor, all, none) can be constructed as a string of the basic operators.

Operators build relations irrespective of the nature or content of the entities, which may be as real as an orange, or something beyond belief but conforms to the relations inherent in the operators. The four basic operators are bi-directional: the validity of *apple and orange* is the same as that of orange and apple

except for the order preference. Similarly *A or B* is equivalent to *B or A*.

The *not* operator negates an assertion of existence that can be verified by evidence. A *not* can not negate non-existence. Consider the assertion: *God created the universe*. It is grammatically correct, but that does not guarantee its validity.

(a) If it is a statement of an opinion, it has to be taken at its face value with faith.

(b) If it is asserted to be evidence-based, the burden of providing affirmative evidence falls on the person who makes the assertion.

(c) If it is asserted that *there is no evidence that God created the universe*, it is merely a statement of the state of knowledge. It can only be addressed in parts by examining the contents. That is long drawn out protracted discussion if both sides with an open mind are really interested in a valid outcome.

(d) Faced with that *it is not so*, the usual retort from the believers is *if not god then who did?* Here again the believers have tacitly assumed that may be evidence for their assertion is not there.

In short, reality is not created by assertions. But assertions are created to examine relations on the basis of evidence between the parts whose content and context is established. As noted above another effective way to examine validity of an assertion is to look into its *converse* and *implication*. Both of these can not be readily handled as simple mathematical constructs. On the other hand, such relations are integral part of real world experience. For example, one can not harvest without sowing (converse), one did not get a harvest even if the field was sown implies that there are

other variables in the process. Note that the operator based (logical) constructs do not demonstrate causality. However, a real causality is implied if the subject of assertion conforms to the operators (i.e. it is logical). The appeal of the logic operators is that defined slices of reality can be manipulated while remaining grounded in reality. However logical is not necessarily reasonable, but anything reasonable can not be illogical.

Often we do not know what we do not know. Nor do we know the full significance of what we do know. Logic operators keep us preserve the integrity of what we know. In working with it with operators and evidence reason can be guided within the within the framework of reality. Thus syllogisms are constructed without knowledge of the causality. For example inductive reasoning with generalizations tries to stay true to the nature and extent of the observed reality. Such assertions are often justifiable if there is greater utility of doing so than of not doing so. The assertion that *all swans are white* was modified when black swans were found in the Southern Hemisphere. Would a single white raven change the assertion that *all ravens are black*?

Extracting inferences from logical assertions: Rarely is anything accomplished through the grand visions heard from pulpits. The search for a reality-based reliable guide begins with the assumption that humans can understand the world of their experience, albeit incrementally. Senses provide evidence for the real world happening, albeit it may be corrupted. The pragmatic belief is that such efforts can be formulated as rules and models to describe the workings of at least the observable and testable parts of universe. Even for the inductive inferences of descriptive natural science where we merely observe and infer from experience, one cannot escape the need to seek independent verification and rationalization of the generalizations.

The staying power of a model resulting from such beliefs comes from its ability to accommodate orthogonal slices of universes. Evidence based inferences further expand the scope of the model. With each set of new inputs, assumptions behind successful models are tested against the expanded reality. Tested assumptions become enshrined as principles, laws and theories with greater predictive utility. From the practice of science, here are the stages through which models improve their validity:

(a) Rule of generalization become a natural law is the statement about how at least a part of the universe operates in terms of verifiable physical reality. The assertion that something cannot be created from nothing is enshrined in laws of thermodynamics that assert the conservation of matter, energy and information. Patterns coded in such laws often begin, as empirical assertions such as *all swans are white*, and then slowly graduate to the status of Laws of Motion which account for the planetary motions, as wells as the machines that started Industrial revolution. Ohm's law for conduction of electricity and many others are now part of the information revolution. Laws with too many limits or no predictive power lose their utility. Laws are falsifiable by evidence. Thus even a single experimental demonstration of *perpetual motion machine*, or *spontaneous generation*, or *omniscience* would invalidate the laws of thermodynamics, and with it may crumble the whole structure of the physical sciences and conceptions of causally deterministic reality. Fortunately, there is no imminent danger of this.

(b) A principle has a more general outline of assertions. Principles connote something deeper than rules and laws. For example, the principles of genetics are verified by inheritance of genetic traits. Principles guide specifics and permit examination of particulars within the domain or framework of acceptable generalization.

Unlike law, principle is not experimentally established, although its predictions are experimentally verified.

(c) A theory is a statement about how the universe operates. Examples include: the atomic theory for the smallest components of the living and nonliving substances; Darwin's theory of evolution and selection of species; or the theory of relativity about the relationship between space, time, mass and energy. Within their applicable domains each theory describes how nature operates on the widest class of phenomena on the basis of as few assumptions as possible. No matter how good a theory is in organizing the past and present, its real utility lies in its predictive power for the future. A theory has little appeal if assumptions are not testable and predictions are not independently verifiable. Acceptable theories are falsifiable through critical results. Predictions of a non-falsifiable theory are unlikely to be reliable, and invariably these are self-referential.

Useful models and theories have explanatory and predictive power. Their staying power lies in such utility. With each development an additional part of the universe is iteratively scanned, and another slice of the universe appears critically consistent or inconsistent with an emerging model. As the models come and go the debris of critical results of enduring reality persist in better models.

Physical laws encompassing the limited experimental contexts are recycled into a new theory or model. Inadequate models are not discarded until more effective new models are in place to adequately accommodate and account for the critical results. In this search *ultimate truth* is a never-ending iterative process, where causality is in the hierarchy of the parts and relations.

Hierarchy and mechanisms. What binds all scientific descriptions is the implicit belief that the evidence based assertions are not independent constructs. The level of confidence in scientific theories is not simply based on the fact that *no non-black raven has been found*, nor on the belief that the ultimate proof of the pudding is the eating. The confidence derives from a consistent set of parts, variables, and relations that describe the functional and mechanistic hierarchy from the subatomic to cellular reality, and possibly higher. At the very least nothing demonstrable seems to contradict it.

As we explore we uncover layers of hidden worlds. For a broad range of physical and chemical phenomena such diversity is reduced to a few invariant assumptions backed by a few variables, constants and parameters. Additional terms may be assigned in more complex situations. However with increasing complexity the level of confidence in the totality of such descriptions decreases. For example, very few biological models are at the level of a tested physical theory. Simulations of environmental and social sciences do not satisfy key criteria for testable closed and isolated systems. Approaches to deal with complex real-world systems are based on operational assumptions with a goal to identify the domain of probability. Hopefully, reason will follow if an order is found.

It is a recent development to relate function at one level of a hierarchy to events at another level. Such structure-function analyses have given confidence in reduction and mechanism. It is promising in the sense that criteria for validity are built into parts as well as the reality-based hierarchy. As promising as it appears, there are unresolved conceptual problems. At one end of the known hierarchy is the quantum behavior in the subatomic level. Behavior of this world cannot be reconciled with the known

deterministic methods that seem to work at the molecular and higher levels. Above that are the complex systems with too many variables that cannot be lumped together or analyzed meaningfully even with the brute force of conceivable computing power. In such complex systems, information impinges on the decision making process in too many ways. Few of these are formalized. In such an environment all pervasive and continuous *perfect* information may exist only for the purpose of rationalizations.

Can ideas from physical sciences be applied to laws governing human affairs? To facilitate human understanding, as through rules of mathematics or physical sciences, it is necessary to recognize that laws for physical reality are tentative in the sense that they have not been proven wrong. Also, a meaningful theory *of* everything, or for that matter a theory *for* everything including truth and theory itself, is wishful thinking. It suffers from the paradox of infinite divisibility as the smaller slices of universe tend to become less relevant in the context of the whole.

The same holds for a prescription of a desirable set of choices for all humans. The potential of a single species lies in the diversity of individuals, each able to adapt to certain niches and changing conditions. It is also intricately associated with other species and happening in the web of life. The deterministic uniformity of the physical universe (even for the simple gases) comes not from the uniformity of behavior of the individual parts, but from the behavior of the chaotic aggregates within the ensemble. Chaotic behavior of individuals, aggregates, and the diversity of the behaviors within the class are the hallmark of the entities that we classify as the viable and sustainable biological species of living beings. It is as fundamental as the deterministic and quantum behaviors.

Bio-logic: Consilience with an evolutionary rationale. The appeal of biological evolution comes from the demonstration that like everything else it is grounded in physical reality. Evolutionary outcomes have emerged in the face of large uncertainties from trial and error in virtually all possible niches over a period of more than three billion years on Earth. The total number of trials is large indeed. Such strategies have charted a course of action for survival, continuance, and sustainability.

Of course, such a snapshot of the present says little about why many more perished on the way. Tautology of *survival* is based on the current state of the species resulting from the changes that occurred randomly over a period of time among the groups of individuals. Often with minor evolutionary changes preexisting functions adapt or remove an organism. Individual functions that assure genetic viability of the species in the niche environment have little to do with the overall fitness of the individuals judged by some misguided external criteria.

Functional changes emerge randomly in individuals of a species over a period of time, and then the population genetics takes care of the rest. In the end, the snapshot of the current state of a species reflects a chaotic mix of changes that has thus far led to the reproductive success for survival in the niche environment. The only attribute of evolution is to perpetuate genes, and as a measure of *fitness* it relates only to past reproductive success. Of course, it is tautology. It does have an advantage of evolutionary experience if we look for it in order to formulate a law or principle to guide the future course.

Can the emerging lessons from the evolutionary experience can guide the deliberate course of human actions? It calls for human choices and decisions whose record is abysmal.

The 19th century formulation of *survival of the fittest* gave free reign to the culture of violence over the next century. Such knowledge-based-rationality of humans turned out to be worse than what humans call *the rule of the jungle*.

Lessons from biological evolution are far too subtle to set the course for global experimentation and tinkering. Natural selection is a rationalization of survival in a niche through processes that required constant changes for adaptation. In our hurry to look for a function with a reductionist mind-set, to arrive at a hypothesis we pick and choose facts and goals. Motives, biases and rationalizations can hardly be peeled way from our actions. A fact may be correct, but for a valid hypothesis one must explore all the relevant facts - direct, consequent and implicit.

Lessons from the suspected disasters of biological evolution can be used to reshape our goals and methods. To carry out the chores of living for some time to come, we may decide to better manage what we know may be a small planet inhabited by a diversity of interdependent life forms. It calls for room for doubt to guide our actions and expectations.

Consilience: Often, reason is not enough. Consilience is crux of reasoning with propensity for deriving conclusions by altogether different, but all-inclusive, means. It is a mindset to deal with situations about which we cannot even intuit. It is a real-time way to rationalize the world-view connoted by the worlds that we are trying to understand.

Inferences and probable premises form the basis for further reasoning. The relationship between facts and syllogistic reasons for a hypothesis may be a matter of debate for a system at equilibrium. Dealing with the evolutionary steady-state dictates even greater prudence about relationships that build on feedback. As somebody put it: *We may be able to design a perfect human being*

long before we know what those traits for perfection are. The task is not any easier for designing molecules, plants and other organisms. As it is turning out, many of the genetically modified organisms lose their viability within a few generations. Potential cures based on the gene-modification are also beginning to show undesirable side effects. In such cases we do not have wisdom of hindsight.

Distant causality with incomplete knowledge. Unintended consequences from the justified true belief in one desire or another include the population problems from improvement in the survival rate. Another is the over-consumption of resources that is built into the criteria for economic progress. Similarly the racial biases are built into the duplicitous policies and attitudes towards the barbarians. Clearly, except for not repeating the mistakes of the past, little can be done to undo the past actions. Yet, something has to be done at least for those that continue to suffer consequences of unresolved issues. The lesson from the history is that certainly, one cannot wipe the slate clean and start over again. Nor should one do so, or even forget the disasters without a challenge of inquiry. It is feedback.

The end and means argument for social issues and conflicts also comes from the condition of incomplete knowledge. Since knowledge is only provisional, natural laws guide to hypotheses conceived to be tested though practice. Application of causality in the affairs of man demands accountability and ability to resolve problems before too much damage is done.

Reason has limits. It is said that information relative to a problem leads to better decisions for future action. In this sense, methods of science have become arbiters of causality and even for the consequence evaluation. With the belief that the best of science is the triumph of reason, scientific reasoning is a kind of dialog between the potential and the actual, between what might

be and what is in fact the case. It is not the causality with immutable a priori. It is a pragmatic construct that predicts based on testable evidence and leaves room for doubt in the judgment. The trial-and-error (empirical and experimental) approach provides a basis for developing the working principles. All this can happen only within the limits of the hierarchies of the physical world.

Human society and the biosphere on which we depend are part of an exceedingly complex web. Its multiple states are only operationally discrete. Their stability depends critically on the local conditions. Pragmatism requires gradual, reversible and non-destructive methods of change. In altogether different context Bertrand Russell observed *such approach is important not only where it prevails easily, but also, and even more so, in the less fortunate times in which it is despised and rejected as the vain dream of men who lack the virility to kill when they can not agree*.

Delayed perceptions. Discounting the fact that even a broken clock is right twice a day, we probably agree that even in the absence of necessary knowledge certain individuals act more rationally in making their choices than others. Also not all actions of even the most rational of individuals can be characterized as rational. History tells us that many of the actions were recognized as rational by most only after centuries and millennia.

Actions are rarely initiated as a matter of thoughtful analysis in the context of the inflexibility of individuals versus variations within the species. Often, in a black-box fashion, we deal with and react to awareness of a stream of consequences resulting from the previous action. Awareness of inputs from event or happening instantiates the experience, which may be evaluated on the basis of prior knowledge for making decisions. Often the real-time actions are based on perception of the reality

and potential of the situations at hand. Rationality lies in the validity of perception that improves the reliability of consequences of actions based on the flow of awareness. For such purposes we have come to rely on tools at least as much as on the experience of the past.

Humans are tool-seekers and tinkerers. On the way to quick-fixes and to satiate desires we battle with ideas and chaos of choices. Need for wider input comes from the realization that humans are limited in important ways. Our actions are driven by momentum than by reasoning. Individuals rarely have the necessary knowledge to make informed decisions in real time. Individually we are able to come up with far fewer relevant choices. Moreover, we rarely seem to be able to make use of the relevant knowledge at hand.

Our ability to imagine alternatives and to speculate comes from group interactions. Through trial and error in thought and behavior we are forced to modify our hypotheses to move gradually away from darkness, hopefully towards the light in which we can see ourselves as well as others. Individuals accept social constraints on actions because plurality of thought and behaviors often takes us from a local to a more global optimum. This is how we learn that not all ideas are created equal. In the same fashion, chaos of choices does not necessarily offer the best choice of tools.

Tools have become synonymous with the solutions that one can pay for. Far more money is to be made by exploiting the way people make choices, than in asking them to make informed choices. Material success unleashed by physical and medical sciences has made desires virtually synonymous with choices in the marketplace. It has wider implications for the systems that are not at equilibrium. The flow of resources from globalized markets

is inherently unfair, one sided, and beyond the normal democratic controls. The forces that caused the great upheavals of the industrial revolution are now being exported over a very short duration to the unsuspecting. In the guise of globalization millions are disfranchised from fashioning their own tools.

Distant causality, synchronicity, and coincidence. Modularity of tools is also built into our ability to conceptualize. It is not always trivial to identify individual causal actions even for some of the most significant consequences. In refusing to deal with such limitations, acausality treats any relationship between events as mere coincidences. Even if one starts with the assumption that events of the universe are random and uncorrelated, our actions may be grounds for cohesion of events through local perturbations. At the other extreme is Jung's concept of *synchronicity*, according to which all events in the universe are connected, albeit in a chaotic way, whether or not we can recognize them to be connected.

To appreciate the origins of such tendencies, consider isolated news reports in which Americans, Israelis, Islamist, or Vietcong killed scores of people. Is it any different than carpet-bombing by the Allies of a French village in the waning days of WWII? By this time Germans had already retreated east and 7000 soldiers were left behind in this village of 4000 on the Western coast of France. Repulsive as it may be, most of us treat such sanitized reports as isolated events. Is it because we do not connect to causality unless we are touched more directly by the consequence? Do we need some tool (pretext) to make the connection?

To move the argument further, consider what caused death of the residents of an Afghan hamlet mowed down by a high-flying bomber sent there in response to two hijacked

airplanes crashed months earlier 7000 miles away into the Twin-Towers in Manhattan. We can talk about the bombs as the physical cause. Clearly, we cannot blame the bomb, even though the dead were hit by the bomb blasts. *Credit* or *blame* depending on the point of view is to be shared by the bombardier in the bay who opened the guns on cues from the pilot. Cues were programmed in some distant office. The operatives on the ground who did not even know that this action is going to take place provided information leading to this action. The same for the scientists who made super-efficient killing machines, or for the politicians who did not explore other options or did not leave other options open. Not by coincidence, as if to pass around the blame, institutions implement actions through hierarchies. You can blame an individual but not the entire system!

Regimentation, through a narrowly defined call for duty at every stage, restricts a role for individual decisions. Without any eye contact humanity of the individuals at the front is further marginalized. The residual associated guilt is *treated* with amphetamine pills prescribed to those on the *mission*. By doing away with the possible humanizing influences that come from active interactions between humans, only the institutions and machines can carry out their work.

In a sanitized, hierarchical, and multivariate world, we operationally, but not objectively, speak of physical cause (bombs), efficient cause (pilot and bombardier), material cause (electronic bulls-eyes, bombers), formal cause (battle strategy, war machine), and final cause (political decision). Clearly the people who developed the relevant science and technology have also contributed to deaths in that distant hamlet. The war-machine justifies this as a collateral-damage. Finally, causality of one's own fault kicks in if death is a consequence of just being there in the

middle of a bullfight. Clearly, when honors and accolades are accorded, many of the same people put forth different spins on their contributions.

The philosophy of assigning cause is far more involved. The political or legal descriptions standardize the cause as *the act of war* or *the security concerns*. Such excuses are phrased with clichés like *weapons of mass destruction* in the possession of the demonized adversary. Of course, our own weapons and methods are only for self-defense! When do we begin to blame the motives as the cause? Economic, imperialistic, and racial motives continue to be insidious and far more difficult to pin down.

Morbid examples, whether from epics or the evening news, make us pause. Our survival instincts evoke emotions. Our innate sense of fair play sometimes causes revulsion against such acts. Human instincts are often countered and blunted by constant barrages and spins. They desensitize us through rationalizations. At some point perceptions deteriorate to cynicism. That is the purpose of psi-op (psychological operations) fog away from the trenches. Wedges of faiths and skeptics give appearance of controversies where there are none. On the other hand, doubt (*syad nay*) appeals for active interaction to resolve identified concern.

III-19. Negate the Wishful

But Scientists, who ought to know
Assure us that it must be so.
Oh, let us never, never doubt
What nobody is sure about.

- Hilaire Belloc

It is believed that subtlety and beauty of the real world is revealed through reason. It takes courage for one to deal with uncertainty. Attitudes and choices determine the nature of future interactions and consequences. A decision to create value requires feedback for mid-course correction. Desires are also constructs of mind like the conceptual schemes and principles. Such constructs are based on incomplete knowledge. Unlike ignorance unformulated constructs are often myopic idealizations of imaginary worlds. At best desires and the derived models speak of human aspirations. Sometimes desires are disconnected from reality.

Tangible direction and meaning to life is perceived necessity. Otherwise, desires and hopes hover around faith in miracles and myths. It breaks what one wishes to uphold. By negating contradictions, individual searches can be optimized to minimize wishful behaviors. It is not about compromises but about examination of the assumptions underlying the goals and methods.

The focus of a pragmatic search remains on what matters and verified. An ad hoc assumption may be introduced for the sake of argument and to explore possibilities. If carried out within constraints of the reality-based and demonstrable alternatives, such searches have been remarkably successful.

Not all ideas and thoughts are created equal. Formal approaches are to be constantly reexamined. In a self-correcting environment principles are constantly tested and revised through the experience of living with those principles. Nor can the solutions be transplanted indiscriminately in or from alien environments. Even the most successful ideas have to be evaluated for the relevance of the content and the context. In the end, no matter *what is out there*, from moment to moment what matters is *what is there*.

III-20. Man is Capable of Being Rational

We are old-fashioned monkeys and futuristic apes. We are sympathetic, canny, crude, and dazzling. We are profoundly aggressive, and we have many loci of control over that aggression. We feel our way to the narthex of love and think our way down its nave. We are like nothing else that has even appeared on this threshing blue planet, and we will become, in the next few centuries, like nothing we can fathom now. And we will do it wearing our same old Stone Age genes.

- Natalie Angier in *Woman*

In an appeal to human consciousness and conscience in shaping rational perceptions Boris Pasternak's Dr Zivago observed: *It is the property of our brain that it makes us aware of ourselves and of the world around us. It is a beam of light directed outwards.* Such rationality is a feedback to improve human condition. Whatever else it entails, humans are curious and inquisitive. It makes them want to control their course by directing their behavior. Whether or not the *light directed outwards* alone is sufficient, the metaphor does appeal to individual decision-making. Is attitude of reason is justified? True? Valid?

Consequence evaluation is sufficiently complex. It cannot be left at the discretion of ad hoc and untested assumptions. Also one cannot bask in the conviction of Cartesian arrogance that an intelligent human being could reason his way through any problem. Argumentation cannot suffice for judging validity and veridicality. Subtleties of nature often supercede subtleties of arguments designed to capture the reality.

What did we learn from animals?

Tools mimic many of the natural devices. We also learn from other behaviors. All animals do everything necessary to survive and thrive. They seek pleasure (gratification) at significant expenditure of their energy and resources. Most animals posture with aggression but rarely have violent fights. Controlled experiments also show that Rhesus monkeys know pain of others of their own kind, and stop hurting them after they recognize it to be so (empathy).

Playfulness as rationality. Appeal to rationality is a component of self-image. It can be a tool for exploitation if corrupted with ad hoc beliefs. Rationalizations are also invented to justify actions and goals where nefarious motives lie just below the surface. It is not clear if there is evolutionary pressures to curtail the damage wrought by brands of fleeting rational approaches that come and go. When the safety-valve does not work, most societies demand a change.

Rationality is an attitude of open search. If the goal is to realize the unrealized potential it lies at the fringes or remain submerged in perceptions. Irrespective of usage, the domain of rationality is narrow and that of irrationality is boundless with little overlap. The value of rational decision making may be in choosing the world of facts to construct usable postulates. In decision-making, past correlations and trends are often used to predict future events. It accentuates the risk in beliefs.

An umbrella of rationality covers individual pragmatic values. Criteria include utility, expectation, satisfiability, effectiveness, optimization Such rationality in behavior applies to all the choices and actions guided by rational thinking. It may

include beliefs which may not yet be formulated, may not have a clear meaning, logical consistency, and empirical verification. Such ethos is not meaningfully articulated. Yet it has autonomous value for which the criteria are rooted in the reliability perceptions rooted in shared knowledge.

Rationality has been treated as the spirit underlying the utility of tools for goal attainment. As a metaphor it may strike some as vulgar. On the other hand, products of rational searches have emerged as tools that continue to contribute more than any idealization of pure rational thought.

The survivors of the change may even argue that the change is for the better. Unfortunately, nothing excludes the use of rational strategies for mass murder and wars. Rationally selected methods can destroy rational thoughts on a massive scale. On more than one occasion, slogans of rational realism have been used to camouflage the status quo and conservative tendencies. Relativistic or nihilist traps (cynicism) offer little consolation against such psycho-sociological fog.

Contradiction is experienced as a violation of rationality. Rational restraint is a form of triumph over one's self. It requires certain traits of character to deal with contradictions: courage against orthodoxy, responsibility to look straight in the face of the facts, and exercising moderation in the expression of judgment. Often rationality is excluded from emotion, feeling and desires. It does not have to be the case unless reality is deformed into delusion. Recall that Dionysian elements motivate human *actions*. As Zorba the Greek said to his friend, *You lack a bit of madness.* After all, in creative work success is attained through playful obsession that often ignores the rules of the game. This is not to be confused with the reptilian instinct of winning at any cost.

Are there rationally drawn boundaries of rationality? According to the laws of thermodynamics, *thing cannot be created out of nothing*, or *events can not happen unless mediated by real entities.* In the same spirit there are two other types of reality-based impossibility theorems. They demonstrate that our naive intuitions about rationality cannot be counted upon to yield coherent and consistent theory:

(a) Godel's incompleteness theorem and the paradoxes of set theory relate to the foundations of mathematics and the limits of analytical approaches.

(b) Milnor and Arrow's impossibility theorem is relevant to the foundations of the concept of rationality and justice.

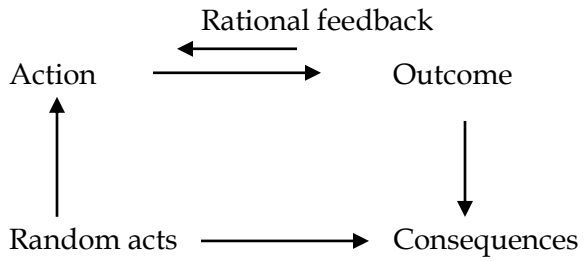
Together these laws provide a deterministic insight: Irrespective of the domain, all actions have associated costs to be paid either up front or in the consequences.

III-21. Making Decisions

Humility in the face of persistent great unknowns is the true philosophy. Remember wherever you go that is where you are going to be. So choose carefully – your wish may come true.

Game theory (bounded rationality) is used to model and simulate probabilities of possible outcomes. It is bounded rationality. It is modern variation of dealing with the decision making concerns with the assumption that snippets and vignettes of reality models add up to probable outcomes.

In the discussion thus far we have implicitly assumed the following ill defined model:



Random actions may have consequences and outcome is not clear. Sustained actions can lead to predictable outcome. Rational feedback from the outcomes facilitates search towards desired consequences. At this level inputs (facts, actions, motivations) and practice build up to the consequences. It is more of an statement. It can not simulated without other information which makes prediction of outcome and consequence evaluation nearly impossible.

One cannot make decisions without options to choose from. All decisions also presuppose something about the future. A decision to act in a particular way is the decision that directs

present to a particular future. It requires planning as well as reverse engineering. It includes abstaining from certain choices, and to adopt or develop a strategy in the context of the other choices. A choice based on the decision also means commitment for action, which requires evaluation of the possible outcomes and their consequences.

Actions codetermine the future. In many cases actions are the decisive factors. Actions depend on the motivation and ability of the person in relation to the environment. Thus one must consider probabilities for the future and deal with dishonesty, or hasty judgment, or plain error in the information on which the decision is based. In the end, the decision process requires reducing many-dimensional valuations to a single chosen hierarchy. It requires ordering of the relevant actions in an uncertain environment. Often chances of success increase if preferences are aggregated into a single preference. The role of logic and reasoning with facts is to eliminate unreasonable solutions, to identify probable alternatives, and discard incongruities.

Rules of the game. Starting belief is that actions have outcome, and decisions have consequences. It is possible to conceive of rules that facilitate doing a single act towards a goal. Not all goals are worth striving for. In more complex situation not every act has desired outcome. Also some choices and decisions are far more consequential. Clearly, there is no method or procedure that always works, and works all the time.

Approaches that increase the reliability of what we know and how we know follow acceptable procedures. For example, the algorithmic and sortal approaches are for incremental validation of knowledge. They rely on justification of existing

beliefs, as well as on new algorithmic inputs of facts and options as they become available. Examination of the implications is critical for long-term validity.

Once established algorithmic approaches lose the sense of inquiry. The procedures deteriorate to the sortal terms of instrumental evaluation of objects. This is not much different from rituals and other (theo-, auto-, techno-, bureau-) cratic approaches. The sortal terms provide the basis for developing the criteria for consequence evaluations based on the use to which objects are to be put. Sorting criteria are based only on what is known. The sortal method does not deal with unknown or ignored criteria. The approach is mechanical and works well for writing specifications for machine parts.

In the consequence evaluation of human actions we are concerned with who is affected by the consequences. Often it is not just the actors or players. Thus all actions are of concern if they influence others directly or indirectly through the institutions or the commons that we rely on collectively. Just passing the buck (blame or responsibility) for the social costs to some entity that is not in the sortal equation is not an adequate solution.

Anything can be built into the matrix of consequence, ranging from how you feel to the utility of the outcome evaluated against self-goal versus individual goal. Much deeper issues lurk underneath the game theoretic approaches. To begin with, goals have to be realistic in a given context, although dreamers do find and establish their place in the scheme of things. If reasons for doing an act affect its utility, then attempting to build this utility into its consequences will also alter the act, and possibly change the reasons for doing it. This results in a feedback loop where, through constant reevaluation, actions have to be iterated towards a desired goal. In this pursuit, principles and rules are useful

starting points: Principle to navigate through the unknowns, and rules for apply the domain of certainty from prior knowledge and current probabilities.

Substantive versus procedural. Bounded rationality is part of all processes by which humans use information to make decision, solve problems, and learn. What constitutes rational or even reasonable can be reached only by viewing the behavior in the context of a set of premises or givens. Such premises differ in regard to goals and values, as well as to the consistency of behavior in relation to the total environment (space and time).

In economics rationality is based on the choices it produces. In social sciences rationality is viewed in terms of the processes it employs. Sociologists are concerned with the origins of the values. They seek to describe reasoning about actions. They seek to determine the use of very limited information processing capabilities to cope with complex realities. They seek to describe and explain how nonrational processes (motivations, emotions, stimuli) influence the focus of attention. All of this has to be done and set in terms of the known and factual givens for the rational outcomes.

Perceptions develop with acknowledged inputs. Bounded rationality is the information and knowledge-seeking process. The concept of information is crucial to methodology. The reliability of information is a paramount concern. The efficiency of the process and pragmatism come later, if at all. Probabilities judged by the experts can rarely be counted to establish the more subjective aspects of satisfiability.

Being informed is about having a question answered. Relevant information and the validity of the result of inquiry is knowledge. Relevant and suitable information transforms the decision. Misinformation can lead to regret. Use of information

for decision-making depends on the suitable use of complex relations. In the game-theory sense this may be of the type *he knows that I know he knows.* Ultimately, the decisions and the foreseeable consequences of actions bear on prediction.

The study of future behavior and goals is also relevant to making choices. It is said that information relative to a problem, whatever that means, leads to better decisions for future action. Here are some considerations for *perfect* information, and the list of criteria is often culled for pragmatic reasons:

1. Categorical information differs from probabilistic information in precision and scope.
2. Reliability of information influences its utility.
3. Reliability of information is related to the reliability of its source.
4. Is the information relevant based on direct or indirect evidence?
5. Is the usability based on induction or deduction?
6. Does the information transform an ill-defined problem into a well-defined decision problem?
7. Questions related to the cost and sufficiency of information.
8. Methods of analysis are about causality. The end and means argument for ethical moral issues results from the use of incomplete knowledge or from the use of selective information.
9. Consideration of the unintended consequences.
10. Relationship between the information and the source.

Such factors are difficult to quantify for any analysis. Probabilistic description is useful for calculating the expected utility. The probabilistic view of information ignores the fact that information about certain events is not meaningfully expressed in probabilistic terms, such as the birthday of a person or the genetic code. Semantics is presupposed in the validity of information as

true or false or reliable. In fact such relations do not become information unless singled out, observed and asserted. We often treat semantic information as true and act on it. It must be abandoned when the consequences of the erroneous identification of the states of the world are serious enough. Such characterizations do not yield easily to probabilistic interpretation.

Hypothetical nature of decision-making. Revival of the action-consequence hypothesis has come from the suggestion that hypotheses based on statistical data are tested in order to guide decisions. Hypotheses do not stem from the brow of Zeus, but from prior information about the world. The hypotheses are not to be a priori: such as animal spirits, man as aggressive animal, money illusion, sexual stereotypes, or Man was made in the image of God.

Reality-based decisions are grounded in facts established by direct observation. Every theory has a central core that is considered inviolable by its adherents. However, this core is always surrounded by a host of auxiliary hypotheses. In the long run, these and more serious disagreements in sciences are settled empirically. This is done systematically in terms of available facts. This requires attention to key details for utility maximization. Here the basic premise is that the reward should be in proportion to the risk. Put another way, the product of utility and probability (chance) of success should increase with effort and actions.

The goal of all decisions is utility maximization. Rational expectation is that humans try to better themselves. Economic and other motivations are critical for the survival needs and well being of the individual and the group. Social behaviors are bounded by contractual relations. Also behavior choices are limited by constraints on motivations and opportunism. With this simple model, if expectations are always formed rationally, the

corresponding economic system tends to steer rapidly towards equilibrium. Rationality implies that at equilibrium people have no motivation to modify their behaviors, and resources will be fully employed. Clearly, such models of group behavior that leads to loss of motivation are not desirable.

The classical equilibrium for the markets is between supply and demand. Underlying variables include innovation, capital accumulation and population increase. Such an idealized situation would produce a constantly changing steady state supported by utilization of resources. Such a state is interrupted with shocks and business cycles. This is not a regression to *an anything can happen* scenario. In such cases failure of rationality may be the failure to correctly interpret available information. In other words, optimal response does not rule out illusions and delusions.

The rationality assumption in the supply and demand scenario requires implicitly that the actors attend to all of the *important* variables about which one has to make decisions, or which can inform the decisions. Unfortunately, the number of variables and information that one must attend to are innumerable. Thus one approaches the problem through a simplified model and the subset of variables that enter into it. The decision-maker has the problem of dealing with a simplified model of the world, making decisions in terms of the simplified model, and of noticing when the model is to be changed. Such responsibility apply to all trajectories for actions.

Learning from new inputs. Easier said than done. Learning from failures is absolutely critical for making desirable choices. In the game theory failure is treated as the loss function. Operationally such a function is introduced as the procedure for minimizing the undesirable choices and maximizing the desirable outcomes.

Statistical inferences are also built around prior probabilities, and such probabilities are assigned on the basis of the prior information (including knowledge and assumptions). Even the statistical interpretation of apparently random occurrences is modified (informed) by new information that changes the weight of the priors. Thus we learn by eliminating the contradictions. We also weigh in the internal inconsistencies as well as the broader inconsistencies with other relevant parts of the world that we discover later.

As on the Monty Hall TV show (III-1) if the probabilities based on the prior information can be assigned, according to Bayes the posterior probabilities are to be reassigned on the weight of each bit of information that emerges later. Each new bit of valid information is not an isolated world unto itself, but it provides an informed basis to continually modify the ensemble of desirable choices formulated as hypothesis.

In closing, key ideas about bounded rationality from the game-theory approach are about maximizing the utility of effort and minimizing regrets from mistakes. They revolve around the premise that the decision for a change to something better is about realizing the latent potential. It is not a zero sum game if value is created. Both rational and irrational outcomes are possible because we rarely have complete knowledge to make rational decisions. In effect, rationality lies in modulating the consequences by evaluating ends and means. The process is aided by watchful conduct and recognition of liabilities. Of course, there is always the *unknown*, defined as what is not known or what we chose to ignore. Yet nothing is to be treated as unknowable.

III-22. Keeping Viable Options Open

If perceptions guide decisions and judgment-calls, Nay reasoning calls for identification of doubt and contradictions.

Certainly, precious little can be done if we believe that we already know what we ought to know or need to know. Humans understand the world around them, and use parts to decisions. We try to identify and understand assumptions and constraints of the contingencies between the events. Purpose of *Nay* reasoning is to avoid self-reference and related sources of contradictions, regress and irreversible actions. It is with the goal to keep the search consistent with the real world behavior. Ancient works on this approach for reality-based affirmative reasoning are to be found elsewhere on this site.

In the Nay approach, for an individual utility of the effort is maximized in incremental steps in a variety of ways:
(a) Tools and devices (identification, definition, description, organization, and categorization) facilitate grasp of the accessible world.
(b) Prior information and behaviors provide a starting point for the criteria-based approaches (analytic and synthetic) to facilitate the search.
(c) With a decision to act, the observer-observed interactions are guided by a need to find what is missing in order to create a seamless whole from the parts.

These stages are interdependent and nested. The search is guided by tentative (*syad*) inferences. Perfection is not elusive, but a better approximation of validity evolves with practice in stages.

Consideration of viable alternatives (*anekant*) keeps the search going farther.

An individual does not have all the necessary resources, at least on the real-time basis. It places an extraordinary demand on a need to develop reliable but tentative perception. This is to minimize contradictions, distractions, random disorder and chaos. Possibly, the assumption here is that the reality-based alternatives emerge as our decisions and actions move forward towards the states of increasing reliability.

Key assumptions of Vacch-Nay or Reasoning with word constructs are summarized below (and developed further in the Nay Section on this site):

Premise: A key difference between a healthy living body versus the dead is that only one asserts *I am*, *I exist*, *I will*, *It is so*.

- By examining the content and context of such aspirations and assertions it should be possible to get insight into the nature of the "I" (*atm*).
- Mind has tendency to hijack words. Refrain is a necessary part of validation of assertions.
- Evidence from sense inputs and their word constructs play are part of assertions, their validation, and use of inference. Significance and relevance do not validate but provide insights.
- The content and the context of a word construct are influenced by intentionality. The quality of interaction of the content and context of a word construct depends on the perceptions of the listener. Caution and care is also necessary to reason with word constructs, or to arrive at a better construct that is consistent with external evidence as well as cognized experience.

- Sense inputs from unchangeable reality are captured through the language of conventions, so also the changeable complexity and inputs from mind.
- Such influences also pose challenge of evaluation of word constructs as evidence. With varying degrees of emphasis on the validity of what one knows and how it is perceived by others it is possible to evaluate validity of word constructs.
- Constructs based on numbers are rooted in reality. Such constructs are logical because they obey the logic operators. Thus mathematics is *tark-nay* (or deductive logic).
- Zero and infinity do not obey all the rules of logic operators. Zero can be forced to do so only within certain conventions.
- Word constructs that do not obey such real world behaviors are likely to self-referential or contradictory.

Nay formalism. As developed elsewhere on this site formal Nay methods of reasoning with doubt and alternatives to peel identified layers of uncertainty go back at least 2600 years. Following the lead of Mahaveer, Gautam and Bharbahu and Kundkund, Samantbhadr (ca 200 CE) reviewed and summarized criteria-based formalism to evaluate evidence (*paman*, *praman*) to arrive at empirical inferences or hypotheses (*naigam*). Unlike any other ancient system of logic (III-23), it entertains only the direct and immediate positive evidence to affirm an assertion. Negation is through affirmation of a negative assertion such as *God does not exist* (III-1). Implications are accepted provisionally as circumstantial evidence. The way their belief system evolved they did not resort to violence and remained vegetarian, and took activist stance against cruelty against animals. In their belief to avoid irreversible actions or dead-ends of dogma and absolutes

did not use force for conflict resolution. By remaining true to their belief that doubt is inherent in all inferences these practitioners of Nay formalism did not see a need for God, omniscience, or creator.

Strategy of Vacch-Nay

- All concerns about a subject are formulated with orthogonal overlapping or independent assertions, each of which can be affirmed by independent evidence.
- Inference from each of the affirmed assertions is used to reconstruct the concern as a valid concern.
- Liabilities inherent in any of these steps introduce limitations and liabilities in the final construct.

The main concern of *vacch-nay*, that later emerged as Nyay (III-23) is to facilitate evaluation of assertions as word constructs. Key assumptions are summarized below. :

1. Assertions are validated by the external reality. It may be complex but it always obeys rules, is not self referential or contradictory.
2. It is a limitation of words that both real and imagined can be expressed by words. As such word constructs do not have reality of their own, not do they identify contradictions and inconsistencies, nor do they confer validity. Consistency with the rules of logic does not necessarily validate a construct, but an illogical construct is invalid.
3. Independent evidence and discourse facilitates validation if the word construct brings out the awareness of the same content and context.
4. Other methods to identify inconsistencies and rationalize assertions include intuition (*anubhav*), guess-estimate (*anuman*),

analogy (*upman*), testimony (*shabd*), ad hoc assertions (*arthpatti*), and lack of suitable counter example (*ababhav*).

5. An inference validated by evidence provides a basis to explore other concerns if the same invariance and concomitance exists.

As developed in the next chapter appreciation of liabilities built into the parts and assumptions, as well as methods of verification is key to the relevance of validated inference for successful behaviors.

III-23. Inference and Successful Behavior

Joseph Rogers and Mahendra Kumar Jain: Quarterly Review of Biology 68: 387-397 (1993).

Abstract: Inference procedures integrate past experience with sense data to permit perception of objects and events. This notion impinges on views of knowledge. The dominant Western view that knowledge is "justified, true belief" is orthogonal to the classical secular view prevalent in ancient India that "knowledge is a means for successful behavior." Both views rely on inference from empirical observations, and both use formalisms and schema for "valid" inference to delineate assumptions, to evaluate liability of conclusions, to assure validity of the knowledge base, and to identify bases for controversies. The view that knowledge is successful behavior explicitly de-emphasizes the a priori, while emphasizing the veridical character of the evidence rather than its "truth value." The syllogism uses reality-based premises and acknowledges liabilities intrinsic in inferences. The approach is useful for dealing with the unknown in unfolding events.

" Are you the smoke from a fire that never burned? "

- Derek Walcott

Introduction

Higher-level communications among humans has evolved from language ability. For interpretation and representation all languages make use of syntax. For example, beyond its root, a verb always has meanings that are understood by its syntax and context. In addition, languages tend to rely on inference procedures, which are thought activities concomitant with the use

of syntax. Both facilitate representational abstractions; however, inference may not be "hard-wired," as syntax ability apparently is during the development. As we will see in this commentary, inference procedures are not derived from rhetoric or the idiom of language, but they are intrinsic in the way the "realist" in us has evolved to deal with sense data,[1] that is, the "world." Inference procedures are inherent in the way perception is structured to form a world-view.

Inference processes impinge upon and derive their force from interactions with sense data, i.e. by such mechanisms humans are guided and encouraged, whether by nature or nurture, to interact with objects and events. Ability to draw context-related inferences helps in generalizing from past experiences. It is obvious that individuals and groups who successfully practice these abilities can orchestrate their future: as creatures who infer, humans examine the things they desire, evaluate the level of desirability, consider alternatives, calculate means of attaining desires, and plot courses of action. In short, valid inferences help in creating order out of life's chaos, and in the form of a knowledge base, this order becomes a basis for successful behavior.[2]

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[1] "Sense data" is meant to include all inputs that lead to awareness of objects and events.

[2] "Behavior" is meant to include purposeful activities of individuals and groups. A broad range of biological and evolutionary constraints determines the success of the behavior.

Features of Inference

Inference is necessary for perception,[3] and useful inferences are **thought activities that integrate knowledge** based in past experience with unfolding events. Since awareness is based on limited sense data, inference processing provides a more complete understanding at representational, relational and inherence levels. Sense data is evidentially fundamental and epistemologically prior for processing of information by inference. As a guide to the arguments in this section, consider an example of activity that involves decision making while dealing with the unknown and uncertain, such as driving to a destination where you have never been before. Inference is triggered by curiosity and uncertainty. The process is purposefully propelled as useful information is extracted from current facts and past experiences. Because of limitations of the sense data and knowledge base, it is necessary to constantly reevaluate conclusions. In short, although road maps and instructions may be helpful, experience requires moment-to-moment interaction with uncertainties. Thus inference is an **iterative activity,** where each conclusion may lead to more questions. To engage in successful behavior, one must not only formulate and revise working hypotheses with a fair amount of alacrity, but one must also be able to target efficiently the appropriate body of facts in the knowledge base.

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[3] To facilitate discussion here, a distinction is made between awareness and perception. While perception results in assigning "thatness," such individuation or differentiation is not part of awareness. "Awareness" is "acknowledgement of stimuli" and may require some form of processing of sense data. Awareness must precede inference-driven perception. By this reasoning, sense data includes all the steps leading up to awareness. "Awareness" is also used to connote perception of whole from limited sense data, although we do not use this sense of the word.

Ultimately it is necessary to evaluate the **liabilities** of inferences. Aside from problems associated with the inference schema, which we shall address later in detail, liabilities of inference come from two sources: validity of the knowledge base and reliability of sense data. Reliability of sense data is assumed,[4] and the knowledge base is used as a **given**[5] for future behavior. As an end product of earlier inferences, a formalized knowledge base is essentially a construct of collective experience. Thus communal experience is formalized and codified to provide a framework to guide activities. Most of the time it works. At times it may become irrelevant, making the trial-and-error approach necessary. In such situations one becomes aware of the limitations of the schema because the particular experience does not always resemble the generalized experience enough to warrant a total reliance upon the communal knowledge base. If anomalies persist, alternatives are sought in terms of fresh input or additional observations. Scientific methods may enter at this point to test alternative possibilities and procedures to ensure the veridical[6] character of the evidence at hand, that is, sense data and the knowledge base.

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[4] Demonstrating the reliability of the sense data cannot be addressed cursorily. Issues related to illusion and mass-hypnosis are generally recognized. Problems associated with "evil demon" and "brain in a vat" are also relevant in the general context where other elements of the inference process may be influenced.

[5] Although the knowledge base is **a given**, it is subjected to reexamination and in this sense is not the epistemological a priori in the view of knowledge as successful behavior. The a priori in Western epistemology has generally been that which cannot be otherwise, such as axioms, laws, and rules of logic. Dictates of logic, which form bases for belief, include law of non-contradiction, reasoning without experience, and undeniability of existence. This is a key distinction between the two approaches as will be made more evident later.

[6] "Veridical character" refers to the reliability of the underlying

The axioms and attitudes generated from inference procedures lead to an understanding of how things work the way they do. They are often useful in anticipating difficulties, for designing solutions, for systematization of the knowledge base, for representational generalizations, and for revealing inherence. Such expanded insights amount to verification of behavior. It is also possible that this fuller understanding may suggest a revision of those old behaviors that led to limited success. Yet, despite all, the endeavor may not be successful. Awareness of such anomalies targets a different area of the knowledge base. On the other hands, contradictions and inconsistencies call for more dramatic measures.

Inference as Purposeful Activity

Inference guides us purposefully in a transition from doubt to certitude and leads from curiosity to conclusions. As an example consider the momentary uncertainty that arises on suddenly encountering a long cylindrical object on the ground. Initially there is the awareness of the unusual stimulus, the long cylindrical shape. This **interaction** can only be useful if the source of the stimulus is identified. This **curiosity** requires formulation of a **working hypothesis**, yet there is uncertainty in its very nature. For example, the long cylindrical shape may suggest a snake or a piece of a garden hose. As a better guide to successful behavior, other things being equal, the hypothesis that the object is a snake has fewer unfavorable repercussions. In order to deal with the uncertainty **verification** is necessary based on additional

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evidence rather than to the truth value of a knowledge claim. The importance of this distinction is further emphasized by the Sanskrit word ***praman*** (*pra* for excellence or perfection as evidence and *man* for standard of measure or to know), which refers to the evidential use of a knowledge base and sustained inquiry.

pieces of information such as size, texture, movement and other features. A series of such iterative attempts at verification may not necessarily prove the identity of the object. Finally it is necessary to devise **falsification criteria** and to **check the liabilities** of generalizations and assumptions.

In examining one's liabilities, the empirical base for philosophy is established. Its useful purpose is intelligible arguments and discourse directed towards viable conclusions. In an operational sense here, the primary commitment is to experience and observation. Although reliance on a priori[5] is not ruled out, inference does not necessarily rely upon such principles or claims. In fact, the validity of inference may lie in its functionality, i.e. successful behavior. This is not a truth based on a priori axioms, but the veridical character of its premises and conclusions requires empirical but independent verification. In short, the processing of an event is initiated by doubt, but with the use of the knowledge base and sustained inquiry inference leads to certitude.

Formalisms for Inference Processes

A formalism for arriving at an acceptable inference is a necessary step toward articulating and communicating the representational character of experience. In assessing the validity of inference, conventional sets of rules assure an unbiased ground for evaluating the reliability of sense data, as well as liabilities of the knowledge base and its assumptions. Thus, suitably formulated inference procedures could form an unbiased, undogmatic, content-free matrix upon which all parties can agree. Beneficial outcomes include means of communication, codes of conduct, means of conflict resolution, knowledge bases, and technologies.

Formalisms for inference have evolved in various cultures. The Greek system, inspired by Plato and Aristotle, is the basis for Euro-Americans. This commentary, however, is inspired by a critical review and remarkable conceptual synthesis in ***Perception***[7] by Krishna Matilal, Spalding Professor at Oxford University. In this book, by critical examination of original and derived literature, Professor Matilal develops several ancient Indian views of knowledge that have been ignored or misinterpreted by Western academics. The strength of the book lies in its detailed articulation of the secular Indian formalisms that were initiated around 600 B. C. by the skepticism of Buddhist and Jin monks against the use of Vedas and Scriptures as a priori. The Nyay-Praman (reasoning and evidence) based system was formalized much later in a commentary by Vatsyayan (before 400 A. D.),[8] although the system was in use as the *anugam* process for at least 1500 years before that period.

The Nyay system has provided a rational secular basis for discussions, debates, and conflict resolution among traditional Indian academics. The book is a rigorous introduction to the basic features of the Nyay system for Western readers. The concerns of these ancient philosophers are ever-relevant. It is all the more significant because Professor Matilal has initiated a very fundamental dialogue among the Buddhist, Greek and Nyay views of truth and knowledge. This should be useful for

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[7] ***Perception: An essay on Classical Indian Theories of Knowledge*** by Bimal Krishna Matilal, Clarendon Press, Oxford, 1986, pp. 438, $30.00.

[8] It is curious to note that the growth of the Nyay system apparently stopped by the beginning of this millennium. A historical fact may be relevant here. Since about 1100 A. D. the Indian subcontinent has been repeatedly overrun by zealot nomads of Central Asia followed by Islamic and colonial invaders, who were generally intolerant of other points of view.

understanding the very nature of such issues as they have evolved in two very different cultures. The serious attempt to conceptualize basic issues and intuitive flow of underlying arguments is illustrated by the chapter headings: Philosophical Questions and Praman; Skepticism; The Nature of Philosophical Arguments; Knowledge as a Mental Episode; Knowing That One Knows; Analysis of Perceptual Illusion; What Do We See?; Perception as Inference; Pleasure and Pain; Imagination, Perception, and Language; Particulars; Universals.

The book is not for bedside reading. An active reader, however, with curiosity, patience, understanding, and an open mind with a willingness to delve into subtle arguments would be amply rewarded with a rich experience. The book deals with topics and considerations that have baffled and aroused philosophers, i.e. how to deal with the unknown in unfolding events. Needless to say, this is one of the motivations of doing science, and therefore the issues raised in this book are of equal importance to philosophers and practicing scientists. The book provides glimpses into the intellectual environment in ancient India and illustrates the importance of diversity and pluralism, however, the book is not motivated by a concern for multiculturalism. The arguments developed in the book are not necessarily against existing methods,[9] but the arguments do provide a viable alternative to many of the problems and paradoxes of Western philosophy. The practice of science relies heavily on the processing of data, and the primary process at work here as well as in philosophical arguments is inference. In the rest of this essay we examine two main inference schema and their implications.

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[9] Paul Feyerabend in ***Against Method*** (Verso, London, 1975) has developed such a skeptical critique of scientific practice.

The Modern Interpretation of the Greek Schema of Inference.

All humans are mortal;

All Greeks are human.

All Greeks are mortal.

As emphasized by modern Western philosophers[10] and illustrated by this example, the classical Greek syllogism is based in a notion of universals. The universals may be classes or genera, which can be broken down through differentiae to species or members. A proper analysis is one that looks to the essence of the thing in question, and notes its universal aspect: its similarity to other things. Its particular aspect, its difference from other things, is not completely ignored but is downplayed. It has also been pointed out that the syllogism is not properly equipped to deal with particulars and individuals and that it becomes so only by extrapolation:

All Greeks are mortal;

Socrates is a Greek.

Socrates is mortal.

With this understanding, Socrates as an individual is not a proper subject for investigation or knowledge claims. He becomes so only by inclusion in the class of Greeks or mortals. Thus, a system of knowledge based on the Greek system became mainly a process of learning about universals, i.e. membership in a set.

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[10] Aspects of the ancient Greek system resemble those of Nyay, which will be developed in the next section. For example, Aristotle expresses similar thoughts in his **Posterior Analytics**. Also, in Aristotle's methodology in works ranging from **Nichomachean Ethics** to **Metaphysics**, one notices a tendency to consider various views, to argue from experience, to examine uses of words, and to attempt to apply a formalism to empirical observation, and arts and sciences. These aspects, however, have largely been ignored by modern philosophers, most notably those who appeal to the a priori, such as rationalists and analytical philosophers.

Modern analytical systems of logic are based in the truth functionality of "or," "and," and "not." The emphasis on connectives once again demonstrates that the concern about (deductive) inference is focused on form and pattern rather than on content. Even with inductive inference, emphasis is placed on rule formation for the process and its reliability as a means of knowing rather than on its content and application. Furthermore, inductive inferences invite doubt[11] because the process is one of generalization of empirical observations, which may not be entirely suited to generalization.

With this understanding of the Greek system, the proof is either correct or incorrect based on formal structure. The emphasis is placed on the pattern of reasoning, which is supposed to be independent of experience. Thus proving and disproving becomes a matter of checking argument form. The implicit "therefore" reflects the independence of the logical rules from the empirical. What has actually been demonstrated is more the proper fulfillment of a pattern than it is a statement of context-dependent information. Premises, which tend to be empirical in nature, are often left in uncertainty. The only valid means of checking them requires that they too be products of reasoning. This leads one to accept the a priori as the only possible basis for knowledge. The a priori (axioms, laws, rules of logic) is consistent with the requirements of the dictates of reason, but it is incomplete. An empirical base may be complete, but it is thought to be inconsistent with the criteria for truth suggested by analytic philosophers.[12]

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[11] As we will see later, the Nyay system accepts this invitation to doubt.

[12] Thus inductive inferences based on recurrence of phenomena yield only probability at best, which is a measure of the degree of certainty.

The Nyay Scheme of inference

There is fire on the hill

(statement of the working hypothesis)

There is smoke there

(citation of evidence)

Wherever there is smoke, there is fire, as in the kitchen

(invoking a general principle with a specific example)

tatha(t)

(given all the specifics above, it follows that)

There is indeed fire on the hill

(conclusion, statement accepted)

This inference strategy permits a transition between the general principle that has been extracted from empirical data to the specific use (extrapolation) of the principle for the current experience. The "principle" invoked in this traditional example is deliberately weak, but it is reality based. This is also the strength of the Nyay schema as it forces consciousness of the fact that the conclusion is based on a particular example: "Where there is smoke there is fire, as in the kitchen." Although the procedure may strengthen the initial hypothesis, one is not allowed to forget the limits of the knowledge base and the liabilities of the conclusion. It is through iterations of the stimulus-inference-verification cycle (by using different examples) that the degree of certainty is increased. Knowledge, then, is a formalism of past experience and derives its authority from nothing else!

The Nyay system and most other ancient Indian systems used for judging validity of a conclusion treat inference and knowledge as events in themselves as well as parts of a general event or goal. Thus generalizations are aspects of an event rather

than being aspects of objects or of the nature of things.[13] Understanding is a matter of being **able to interact successfully** with the event or object at hand. This requires that we be aware of the similarities between events as well as of the particular nature of the event in question. Like all events the way to understand these "mental" events is to observe their causes. To judge their validity one should also look not only at their **characteristics**, but also at their **effects**: behavior.

Praman are causes (measures) of a knowledge event by being the means for knowing. For example, reading a book is a means for knowing the content of the book, laboratory experiments are means for establishing or revising a theory, and seeing is a way to familiarize oneself with one's environment. These praman, when used in their proper (appropriate) domain, result in successful behavior.[14] Formalizations and articulations of the processes and their conclusions are termed "knowledge."

In the Nyay system there is praman for each thing, even for praman. In order to avoid infinite regress, praman theorists posit that certain praman are "self-proving." This is a result of a stipulation that instrument and object roles can be assigned to the same entity. Praman theorists "prove" this stipulation by appeal to an empirical observation about light. A source of light is the means for sight, but it can also be an object for sight. Thus light has both "means" and "object" roles in regard to sight. Praman theorists also appeal to another analogy, that of a scale, i.e.

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[13] Another way of dealing with this topic would be to consider recognition of the universal, or ability to universalize, as a step in the knowledge episode. This step does not necessarily require focus on an object, nor does it require extracting an aspect of an object. With the Greek system, the universal is instantiated by the particular, i.e. a real entity exists in addition to the particular.

[14] This, of course, assumes that there are no further complications, i.e. conditions are optimal.

comparison to a **standard**. First a scale is used to weigh a lump of gold. Then that lump of gold can be used to calibrate other scales as well as to check the accuracy and precision of the first scale at other times.[15] The purpose behind this analogy is to show that with a physical object, which is real and indubitable, it is possible to test the reliability of praman. Praman may also be "self-proving" by being non-dubious; that is, there are no reasonable grounds for doubting the reliability of the praman in question.[16]

Yet these criteria may become self-serving in their circularity. In order to be sure of the objects of knowledge we need reliable praman, but in order to ascertain the reliability of the praman we must have an established object of knowledge. In focusing our attention this way, however, the praman theorist may have in mind some form of mutual dependence whereby proof strategies appear circular because of the interdependent natures involved. This is distinct from "vicious circularity" which can be avoided by taking advantage of intrinsic hierarchies (inherence), mutual dependence, and iterations. Through such validating procedures, both the means and the objects of knowledge are ascertained. Singular events such as revelation are also weeded out by the trial-and-error and iteration methods.

A question can arise at this point: How do we know that we will ultimately survive and thrive with the praman of trial and error? Another way of asking this question is "How do we know that trial and error is the most efficient way to arrive at a result?"

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[15] Although values for weights may be arbitrary and conventional, the underlying fact of constancy of weight (in the case of gold) is not. These methods are remarkably similar to "standardization" protocols.

[16] This is not to suggest that the praman are a priori in the sense of being independent of experience but rather that they are consistent with the set of other praman and with the knowledge base.

This we do not know. We know that we have been successful so far, but we do not know whether or not another praman might have given us greater success. To some extent, however, survival does count as proof that trial and error is a valid praman for survival. Nevertheless, there may be others, and as a result the status of our knowledge is placed in question. In response a praman theorist might say that in order to test alternative means for survival and thriving, one would have to use trial-and-error praman because one does not know unless it is tried. Thus trial and error must be a valid (but not necessarily the most efficient) praman,[17] and by iterating it along with other applications of it in terms of other praman we validate it and its objects.

Comparative Analysis of the Nyay System

Yet a holder of the "justified, true belief" theory might object that praman must be evidence as well as a cause. Cause-and-effect analysis would seem to avoid the problems involved with justification, but evidence is still needed as to why anything counts as knowledge rather than just as an experience. Although confirmatory behavior is sought, if events are translated in terms of the praman, then we have a circular proof for the validity of the praman. For example, in the analogy to light used by the praman theorists, light may be an object as well as the means for sight, but it does not make sight veridical. Sight, a praman, is assumed to be

[17] Although we cannot conclude that trial and error is the most efficient praman, we can claim that at this stage it is the most efficient praman available to us. If we should discover more efficient praman, it would be through trial-and-error. Iterative strategies involving systematic departures are useful if the key features of the system are known. Iterations differ from repetitions (checks for reproducibility) in the sense that one or more parameters are systematically varied.

veridical, and then observations are used as evidence to "prove" other claims.

Although it is true that we have sight, we cannot know that seeing is an accurate way to perceive reality. To claim that successful behavior results from acting on sight. It is not entirely helpful, for this does not guarantee that things are perceived as they really are but rather that appearances can be manipulated[18]. Of course, the unknowable possibility that there may be other aspects of reality, which are not accessible, cannot be addressed. Nevertheless, it is recognized that sense data may be inaccurate by virtue of being transformed, incomplete, or flawed in some unknown fashion. To discuss this problem and the praman theorist's response to it, it will prove helpful to examine how Nyay theorists deal with the problem of illusion. Take the case in which a piece of garden hose is mistaken for a snake. According to Nyay in a case of illusion, there is superimposition of memory on perception. This involves misplacement due to a similarity of features between two objects, one of which is actually perceived, the piece of garden hose. The likeness between a true snake perception and the illusory one also comes into play because the two are similar in some of their properties. What is seen, then, is actually a revival of memory triggered by the garden hose's similarity to it. The piece of garden hose causes an illusory snake image, which is close enough to the perception of a real snake to

[18] In Book 7 of Plato's **Republic** the reader is presented with a fictional world of people chained to the walls of a cave. These people are presented with various shadows on the cave wall and become quite apt at interacting, predicting, and talking about them. The purpose of this example is to emphasize that we are prisoners of our words and sense perceptions. The experience that inspired this metaphor is a common occurrence in the acquisition of the scientific sense data (micrographs, spectral peaks, and tracks of the cloud chamber).

cause the misperception. Most likely a yet-undefined judgment is involved here. Along these lines, Buddhists claim that all perception is laden with concepts and judgments and that these can be wrong. A response that would be consistent with the Nyay position may lie in the fact that the awareness of the snake is **momentary**, but perception cannot be momentary.[3]

The uncertainty about whether an experience is an awareness or a perception introduces Gettier-like problems.[19] Consider the following. One sees a cow in a field. The creature is identified as a cow by its dewlap. What one identifies as a dewlap, however, is a piece of cloth tied around the cow's neck. Thus it is not clear whether or not the event is a knowledge event. On the one hand, it is a knowledge event because the object of perception is correctly identified; it is indeed a cow. On the other hand, it is not a knowledge event, for one has used a faulty piece of evidence, the cloth-as-dewlap, in reaching this conclusion. Exacerbating this situation is the Nyay claim that one need not know that one knows in order for the experience to count as a knowledge event. This claim could be applied to this case to suggest that one does know that there is a cow in the field, but one does not know that one knows it.

If an attempt is made to analyze the event in terms of its causes, its characteristics may be clearer, although it may still be impossible to decide whether or not it is a knowledge event. There are at least three causes to this particular, complex, knowledge-like event: the piece of cloth, the misidentification of the cloth as a dewlap, and the inference from a dewlap to a cow.

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[19] Matilal presents Gettier-like problems on page 136-138: (a) A gambler guesses the number of concealed dice correctly; (b) a dust cloud in a field is mistaken for smoke, but there is a fire there; (c) a cow is identified by a cloth which resembles and is mistaken for a dewlap.

The inference from a dewlap to a cow is unproblematic; it is a valid inference. Noting the use of "tatha" in the Nyay system, it does indeed follow that there is a cow in the field. Nonetheless, there is misidentification of the dewlap. Thus, although the inference to cow is inviolate, the inference to dewlap is not; and the "dewlap" is one of the causes of the event. Therefore, even if the conclusion is correct, it is not a knowledge event. Yet a possible escape from this quandary lies in the idea of confirmatory behavior. The Nyay theorist would probably respond that it is through iteration that the first experience is validated or invalidated. Rarely are judgments formed or decisions made based on one look at a thing.

Yet there may be some instinctual reactions to first appearances. In the case of the garden hose-snake, the instinctual behavior would be avoidance. Thus there may be error, but it is better to err on the side of caution rather than on the side of completeness. That is, survival and successful behavior may require quick reaction to sense data resembling that from a snake. Thereafter iterating the process can check the validity of the initial awareness. In the long run, one who acts in this fashion is more apt to be successful than one who attempts to see whether or not the object is a snake before reacting.

The philosopher, however, does not disagree with the biologist on the utility of sight and reactions to it. That could be called "wisdom". The philosopher's concern is focused on the reliability of sight as a way to know. Although it is possible to explain why a piece of hose might be mistaken for a snake, this does nothing to alleviate the skepticism about knowing-as-seeing. An organism deals with uncertainties at two levels. First impressions are confirmed, and then the veracity of the evidence is established. Both of these require multiple "looks" and

consistency. Sense experiences are **sometimes** in error. Yet this knowledge requires independent experiences. In order to demonstrate that a particular sense experience is in error, it must be compared to other sense experiences. Thus the claim that sense experience is generally invalid as a means to know results in a paradox. Once out of the quandary of having conflicting sense experiences, one can invoke additional criteria to establish veracity. The empirical character of the evidence is implicit here. Thus in order to say that **some** sense experiences are mistaken, sense experiences must be admitted as a framework for making judgments.[20]

Nevertheless, a philosopher might remain skeptical. Although iterations to confirm and disconfirm sense experience are effective, it still remains unclear what is being confirmed or disconfirmed; it may only be appearances and not the thing-in-itself. Thus there is no guarantee that "truth" or "knowledge" as viewed in some circles[21] will ever be established this way. The Nyay position and the biologist's position seem to merge here: as long as successful behavior results, what point is there in doubting? In order to know, we do not need to know that we know; we only need to be free of systematic doubt[22].

Interpretation and Representation

Perception in a knowledge episode comes from sense data through inference and concept attachment. Attempts to

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[20] This moves the argument of Classical Skeptics, who suggest suspension of judgment as the proper response to the uncertainty involved in sense data, to the level invoked by the consistency of sense data. For an account of Classical Skepticism see Sextus Empiricus' **Outlines of Pyrrhonism.**

[21] For example see **The Vienna Circle**, Greenwood Press, New York, 1953.

[22] It should be noted that Nyay is not merely calling for psychological certainty but is also calling for theoretic certainty.

comprehend beyond dimensions amenable to direct observation require representation by extrapolation or interpolation. The representation and interpretation of "whole" from limited sense data requires perception of and assumptions about internal order and relations. Traditional methods used for creating a knowledge base include standardization, pattern recognition and differentiation with reliance on conceptualization, comparison, organization, systematization, and use of inherence or intrinsic hierarchies. Such manipulations and generalizations require different degrees of interpretation and representation of the original sense data to create observations, which facilitate the search for particulars and universals. Several "cross-currents" may be at work here. Initial awareness may be of the universal; however, for various reasons one learns to differentiate, i.e. nature favors universals whereas nurture directs towards particulars. Then again, developing a perception of the whole from parts, as well as searching for the underlying order and causality, directs us towards phenomena and universals.

At the basic level the connectives can be broken into analytical truth functions ("and", "or" and "not"), which have served well in developing algebra and consequent technologies. It has been difficult to address more complex or "open" systems by this approach, although attempts continue. One way to get around this limitation is to look for inherence, i.e. explanations in terms of other levels of hierarchy. This process is also inference-based, and it aids in developing "hierarchical" perception of what is hidden from view. The impossibility of a complete analytical description of the whole from parts has been demonstrated (Godel's theorem). By entertaining doubt and controversies in this search for "whole" and order, skeptics, mystics, and dialecticians focus on different praman. Formats, formal methods,

criteria, schema and protocols to accommodate such demands are necessary and still evolving. Some of those used in ancient India are described by Krishna Matilal, and they bear remarkable resemblance to those currently accepted. For example, the "atomist" Nyay view called for three levels in the representation of the particulars in the material world: "substance", "qualities", and "motion". These can be roughly interpreted as atomic, bonding and kinetic characteristics of matter, which together constitute the basis of the modern chemical world view: the properties of molecules are represented in terms of the bonding relations of atoms, and the behavior of macromolecules is interpreted as an extension of the thermodynamic and kinetic properties of smaller molecules and their environment.

Ancient Indian philosophers also addressed questions related to universals, and the basic elements of their approach are interesting. Spatiotemporally speaking, no two objects or events are identical. The origin of systematic doubt in representation and interpretation lies in ascertaining the similarities of the current experience with others in the past, and at the same time in recognizing the distinctness of the present. The idea of thingness is generated and elaborated in terms of the percept (identity of the object) and concept (identityhood, class or sets). According to one view, only the particular is perceived, and the universal is a concept that is necessary for inference and for "seeing" the unknown. Also in an attempt to capture the diversity through language and universals, approximations are necessary which force an order by pruning away certain features of individuals. Such conceptual artifacts attempt to capture the "essence" rather than the individual aspect. Consider the case of identity of an apple and its essence that makes "an apple an apple", i.e. a member of the apple family distinct from the pear family.

Even though there is doubt intrinsic in representation, the means for introducing the doubt and attempts to resolve it are empirical. Satisfactory formalisms or schema to assign membership to a class are often based on some intrinsic property rather than just on appearances. Yet trial and error shows the liabilities of such representations. It is clear that whenever such concerns arise, the representational framework accommodates by allowing additions and modifications. Such constructs are necessary; however, the underlying limitations have not been adequately explored.

According to the Nyay view, conceptualization is a useful faculty, which helps us, organize and sort undifferentiated sense data. A skeptic Buddhist view is that "thatness" (reality) is beyond representation even as a concept. The origin of this dialectic probably lies in the following. Concepts verbalized as words are limited in scope as means of effective communication because the overall process, reconstruction of the message by the listener, requires the use of inference schema and a knowledge base. The knowledge base of two individuals can never be identical; therefore it is also possible that with the same inference schema and sense data, the conclusions may differ. Thus, the intrinsic limits of conclusions should be kept in focus if one appreciates that concepts are only a part of the relevant knowledge base chiseled by specific inference procedures.

The transition between articulation and the origin of the underlying concept has intrigued many Indian philosophers because Sanskrit scholars have traditionally assumed that concepts and language are intrinsic to mind. Around 500 A. D., Bhartrahari argued that reality is an impartite whole, which is impartible and therefore cognized under the guise of concepts and universals. The role of nonverbal thoughts and awareness is

recognized; however, such awareness is deemed "not effective enough." In this state there is a "speech potency" (**sphota**) that is innate to all humans. It is the language of cognition and it is the precursor of formal language, but it is not formal spoken language. Thus in our verbal behavior, the "meaning" is divorced from the real "word" of the innate language, and it is attributively identified with the thing. It would be interesting to see if such ideas have validity in developing a better grasp of our representational universe, which is in effect the object of all scientific pursuits.

Epilogue: Philosophy and Science

The answer to the poetic question posed by Derek Wilcott is the metaphorical "Yes, indeed, there is intellectual fire where this smoke came from". It is a fire for cooking, not for incineration; it provides warmth for growth, rather than heat for analytic refinement. Trends towards the two views of knowledge have existed in most cultures, and most individuals seem to be aware of such possibilities. Preferences of different cultures seem to be reflected in or arise from the a priori. The views contrasted here are but two orthogonal approaches to evaluate awareness of events and to reconstruct the world, but the differences between these cannot be undermined. The basis of such activities may lie in some of the mechanisms that process sense data. Also the importance of inference activity for successful behavior has Darwinian overtones. Although we do not wish to be drawn into detailed discussion of social and political implications, it may be provocatively suggested that many of the unpleasant episodes of world history have been inspired by misinterpretation of views of knowledge. Both views of knowledge are subject to misinterpretation: in one case there are temptations for "short-

term success," and in the other case personal beliefs are justified as "true beliefs". For example, recall the premises of the "new world order" promised by holy wars, crusades, racial genocide, colonial domination, and "manifest destiny". The main difficulty with the "justified, true belief" approach lies in the fact that justification is always limited by the knowledge base, and the knowledge base is limited by the constraints under which humans operate. Therefore the "true belief" remains merely a promise of a premise.

While the "justified, true belief" approach may be an early stage in the evolution of the social order to establish the power of a group or an individual, viable and vibrant cultures have often adhered to knowledge as a means to successful behavior. Not only is such a view less likely to be perceived and interpreted in absolute dogmatic terms, but also an appreciation of the liabilities of the assumptions intrinsic in the knowledge base provides for an environment of discussion, exchange, acceptance and coexistence. In a naive way, we believe that sciences, arts and philosophies prosper in such an environment of "live and let live."

The mainstream philosophy of modern science is based on the view of knowledge as justified and true belief; the epistemology based on this view dominates. Such analyses have tended to be historical, after the fact, and a posteriori. They examine **status quo** views and the way changes occur in these views. According to this premise of paradigm[23], science is a means to derive or arrive at the truth. Yet in practice, this approach has created or runs into dilemmas, Gettier problems. This is acknowledgement of the fact that analytical solutions are applicable only to isolated and closed systems. Awareness of such limitations is intrinsic to the very nature of science as practiced on

[23] For example see ***The Structure of Scientific Revolutions*** by Thomas Kuhn.

more complex systems or to dealing with unfolding events. All this is a necessary part of reality-based search.

At the level of initial discovery, observation and data gathering dominate science. In order to process and systematize data it is useful to have suitable working hypotheses. Generalizations and representations evolve from empirical methods. Here philosophy and science converge in inference, as Nyay theory makes clear. In the microcosm of the workbench or textbook, methodologies based on the formalisms for inference could introduce a new degree of flexibility into the learning and knowledge-gathering process. At the stage where one relies on gathering and interpreting data and formulating theory, one must be keenly aware not only of errors in data but also of liabilities in the knowledge base and inference schema. Targeting these areas may provide guidance in obtaining useful information to be added to the knowledge base so as to minimize these liabilities. This requires the use of non-overlapping iterative procedures by different methods to circumvent the limitations of each individual method. In short, a useful blend of philosophical attitudes and scientific methods is key to successful behavior in both fields.

Explicit recognition of liabilities has deeper implications. In the Nyay system, the liabilities of the inference are built into the knowledge base that is relegated by "tatha" to arrive at the certitude of the conclusion. Uncertainty in the knowledge base would necessarily introduce uncertainty in conclusions. If the conclusion is found to be "wrong" by the criteria of successful behavior, the schema permit modification of the knowledge base. This is not a trivial issue, because in a subtle way the inference process acts as a check on the internal consistency of the schema, and any uncertainty should find its expression in the sense data or the knowledge base. This is a built-in self-correcting **mechanism**

that comes into play by the iterative procedures forced and set in motion by the link "tatha". It makes the Nyay-Praman schema not just a statement of premises and paradigms, but rather a mechanism to evolve the internal and intrinsic relationships between sense data and the knowledge base. Explanations invoking inherence (such as atomic to cellular) are examples of such a process at work.

To recapitulate, Nyay schema are similar to certain aspects of the Ancient Greek system, but Nyay schema have been largely ignored by modern philosophers. Although viable formalisms based on deductive schema have certain advantages and are probably responsible for technology-oriented attitudes, the advantages of Nyay schema over analytic schema cannot be ignored. One of the key differences is in the way Nyay focuses on the eventhood of knowledge and inference rather than fixating on some object of knowledge and employing inference merely as a means to deduce it. In the Nyay theory, there are two main courses of a "knowledge event": empirical observations and praman. A philosophy, which incorporates the concerns of Nyay, and thus those aspects of ancient thought, which have largely been ignored, could add valuable insight into methodology, and validity and formalisms for inference. A science where both practice and philosophy are based in empiricism would be more efficient than a science based on the premise of "justified, true belief." Since the criterion for "knowledge" would be contained within empiricism itself, there would be no need to generate an additional theory to ground its truth. At the same time scientists would be aware of the liabilities of any inferences they make. Thus a combination of the orthogonal methods of Nyay and analytic reasoning is the key to successful behavior in both philosophy and science. In effect, resonance and dissonance of the

microcosm of a useful inference schema facilitate the evidence (facts, experiments, observation, data, information) to a path (direction, trend) of understanding the mechanisms and cause (hetu that identify the universal from the particulars) as part of the shared knowledge.

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III-24. Genesis of Syad: The Logical Doubt

The virtue of a logical proof is not that it compels belief but that it suggests doubts.

- Nietzsche

Origins of *syad* doubt lie in the ways we experience, express, infer, and extrapolate from the observable. Each step along the way voids are filled with assumptions of uncertain validity. The *nay* reasoning takes such liabilities into explicit consideration.

* Behold the light emitted from the Sun,
What more familiar, and what more unknown?
While by its spreading Radiance it reveals
All Nature's Face, it still itself conceals. **(***Blackmore*)

* Do you really believe that the sciences would ever have originated and grown if the way had not been prepared by magicians, alchemists, astrologers and witches whose promises and pretensions first had to create a thirst, a hunger, and a taste for the hidden and forbidden powers? (*Niezsche)*

* Anyone who isn't confused does not understand what's going on. (*Dimitri Simes)*

* True science thrives best in glass house, where everyone can look in. When the windows are blacked out, as in war, the weeds take over; when secrecy muffles criticism, charlatans and cranks flourish. (Max Perutz)

* The concepts we habitually deal with correspond to logical functions that are more than simple conjunctions of two or more events, and the possible number of these logical functions rises much more rapidly. (Boole)

For sensitivity training consider the assumptions behind this poetic line as an assertion:

I talk to trees, but they do not talk back.

In the *syad* sense, a better assertion would be:

I talk to trees, and I do not hear their response.

In the first case we assume that trees did not talk but they may be able to talk. There are many other possibilities: trees did not understand, trees do not hear, may be we do not understand what trees said in their own way? Such possibilities are part of an assertion, and we can not be sure that we have considered them all.

In fact, as late as 1920 such possible assumptions continued to surface in the proofs of Euclidean theorems. More sinister aspects of the problem show up in the political and social experiences as the unintended consequences. People have been annihilated by labeling them ignorant because they did not speak Latin, or do not have a book. Native New Zealanders lost their country because the content of the document in English was different than in Maori. Exasperated with un-kept words and broken treaties, natives of the Americas and other Colonies had plenty of reason to assert that *white man speaks with forked tongue*. We can quibble about the anatomical basis of the assertion, but the point remains that *nobody heard their cry*.

It takes great courage to admit what one does not know. Traditional devices of well-reasoned discourse with pointed questions and answers are useful to develop a deeper understanding of the limits of what one knows. Viable alternatives are useful to isolate the unknowns. Story-telling traditions encourage such explorations of the alternatives.

Nay reasoning builds on affirmed assertions.

The basic assumption is that all mental constructs are to be validated by independent sense evidence:

- Word constructs express real as well as the imaginary worlds.
- Not only the inputs but also the assumptions are to be scrutinized by reality-based relations (logic operators).
- Grammar and logic may scrutinize relations but do not confer reality.
- The validation process is facilitated if its constructs are shared with others for scrutiny and relevance.
- Validity emerges in incrementally as each viable alternative is included in the assertion, or ruled out by affirmative evidence.

Affirmative Evidence: *Not-yes* does not necessarily *no*.

Representations rooted in reality are examined systematically and incrementally with reality-based rules. Imagine, on your walk through the woods you are startled by a noise in the bush. Instinctively you step-out of the way. If curious, then you may explore and assert:

*The creature may be a crow **or** a rabbit.*

It calls for additional facts to arrive at a definite and valid conclusion. In this construct awareness of the lack of adequate knowledge is the beginning of the effort for additional inquiry. There is more to it.

Contradictions. If you saw a rabbit run away and a crow fly away, a meaningful assertion would be:

The noise could be from the crow, or the rabbit, or both.

But one can not assert that:

The creature which made noise is (both) crow and rabbit.

The sentence may be grammatically, rhetorically and logically adequate. But only on the basis of prior independent evidence can one question the validity of the last assertion: It contradicts representation of rabbit and of crow as separate entities, and there is no reason to postulate a new entity or class of also entities if the uncertainty is due to insufficient information.

Logically the last assertion is not much different than let us say *the entity G is every where and nowhere.* Based on our representation of the boundless space it is possible only if G is indistinguishable from the expanse of the nothingness that we call space. If something is everywhere in the *space*, it cannot have a *place* anywhere in particular. If G could be assigned a place in the scheme of things, it could be scrutinized affirmative evidence and subject to the rules of reality based logic. Feel free to apply this to the characterizations *ever present* (infinite time), *omnipresent* (infinite universe), *omnipotent* (infinite power and energy), *omniscience* (infinite knowledge).

Logic has bounded validity. Logic is intimately tied to the rules of word representation: The assertion

The noise came from a crow, or a rabbit, or both.

is logically consistent with the world as we know. But it does not necessarily assure that *it is so*. To minimize doubt, as a first step Nay calls for affirmative evidence where it is possible to say:

The noise came from a crow, or a rabbit, or both, and nothing else.

It is also logical, but some more doubt (*syad*) persists. Have we examined all viable alternatives (*anekant*)? Unless negated by positive evidence all viable alternatives have a finite truth-value.

Fuzzy assertions. Fuzzy boundaries (redundancies) are part of word constructs. We understand world by reducing fuzziness. This what we do as we explore the range between generalizations

and particulars (#A8). The search remains rooted in reality if it done logically with suitable attributes, relations, and criteria of evaluation. Often it is difficult to peel out fuzziness, even from the atomic statements about a defined world. Such real world concerns are sometimes trivialized as semantics, skepticism, fuzzy thinking, or fuzzy logic.

Often we make up above shortcoming with beliefs. Here again we minimize damage by using rules of logic to identify, cognize, define, and manipulate our belief. Such beliefs may be logically consistent but that do not assure validity of the beliefs. Confidence increases further if the outcome of belief is relevant and useful to solve real world problems. On the other hand, beliefs that are not consistent with the rules of grammar and logic can not be validated by evidence. It is the realm of faith. It is out of the bounds of real worlds, and it can not be evaluated by real world methods and criteria. These are the attributes of non-existence. It makes the whole subject not a controversy but a non-issue.

Realization of the fuzzy bounds of assertions has emerged in the approaches of probability, multi-valued logic, fuzzy-logic. Fractals are visual representations of what can happens through successive iterations (simulations) if the fuzz in the representation is not precisely controlled. It is dramatic demonstration of unpredictable outcome of an event that is systematically manipulated. Simulations literally show that with suitable coincidence *fluttering of butterfly wings in China can cause a hurricane in USA*. In real worlds we can not predict a series of such exact coincidences, nor can we be sure that it ever happened or if it will happen again. In other words we can not rely on to manage our affairs (Bhadrbahu, II-9).

Not-known and non-existent (implied)

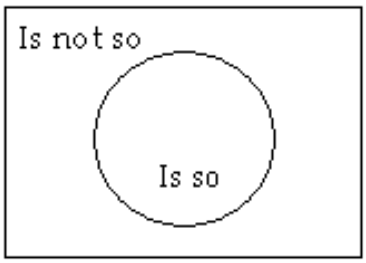


Figure III-1. Venn diagram of a binary world: Beyond *is-so* (true) lies the *is- not-so* (interpreted as false) within the square boundaries of the world. The universe outside the square is discarded ad hoc includes non-existent as well as not-known.

Fuzziness of the binary world. Aristotelian atomic statements are binary (Figure III-1). Negation of *is so* necessarily lies outside the circle in the space of *is not so*. However the boundaries of this binary world separate it from the rest of the universe that is out side the rectangle. Logic can deal only with what is within the square. The Nay position is that unless we are sure *the domain of reason* about a concern may extend well beyond the world of rectangle.

Doubt: Assumptions and consequences

A curious 5th grader liked the challenge of parable. One evening father started: There was this bird that found a way to the grain storage bin of a peasant. It flew into the bin, took a grain, went back to the nest, and then came back. It took a grain, … and then came back. With sleepy eyes father repeated the same line for several minutes. The annoyed listener asked what happened in the end. Father said all the 30 kilograms of grain was gone in 3 months. The listener found it easy to calculate from the given facts that the bird took 10 kilograms of grain every month. Father asked you mean the peasant did not check the bin for 3 months.

What other assumptions are necessary if we want to know the numbers of trips that the bird made in 3 months? What happened to the health, well-bring and social life of the bird? What affects it had on children and mates? Of course such assumptions and considerations are critical for consequence evaluation.

Concerns about our dealings with the averages are generally treated as statistical uncertainty which can be expressed if the event can be repeated many times over. If a behavior is never seen again, a fluke event is remains outside the realm of statistics. Such flukes of miracles can not be distinguished from the random noise of the background including the random coincidences.

If a particular outcome is always associated with an event, assigned probability is 1 (or 100 percent) for *is-so*. One the other end of the scale 0 probability is for *is-not-so*. For occasional outcomes fractional probabilities are between 0 and 1. This is the basis of the multi-valued logic. Good many, if not the most, occurrences of every day world fall in this realm. In such cases doubt persists about the reasons for the departure from the event-outcome relation. As such statistics ignores information that underlies such departures from the probability of 1.

Probability relates to causality associated with event-outcome relation. Probability of 1 means perfect causality. Fractional causality could suggest that the cause is not always there. Probability of 0 means that the cause is not there, the causality does not exist, or other real world events mask the cause-and-effect association. If these other events are random, one could improve the certainty by repeating the measurement many times over. Inability to improve means the assumption about the causality is not correct.

Consider the reverse implication associated with causality. Even if the repeated measurement improves the certainty, it does not necessarily mean that the assumption about causality is correct. Such concerns cannot be dismissed even for the near ideal microscopic or atomic events. In fact much of the progress of modern science is based on the understanding of such events, their causality, and also of what distract from causality. It is a critical step to arrive at the reliably valid conclusion.

Causality of events that introduce uncertainty and doubt is virtually sacrificed for most statistical treatments of behaviors except as the fractional probabilities. Irrespective of the method one uses without additional information it is not possible to evaluate the deterministic significance of the statistical probabilities (generalizations) for an individual event. For example, a home-test for pregnancy is 92% reliable, and it may give a false positive in 8% of the case. Of course it is meaningless to say that a person with a positive test is 92% pregnant, or a person with a negative test is 8% pregnant. Here we are not necessarily dealing with uncertainty in the initial input or data. Repeating the same test many times over will not improve the level of confidence.

Logical way to handle doubt (*syad*). Doubt exists in real world. The reality of existence is the evidence against contradiction. External evidence only affirms what exists. Such knowledge permits identification and resolution of inconsistencies. The challenge is how to distinguish what is not affirmed by evidence. As outline in the Venn diagram (III-2) two of these states are not known to exist (UN), or not-known not to exist (UN). The domain of not-known (U) is within real universe. It is meaningful for further consideration if it exists (U-E). In a real world, it is also

useful to know if it does not exist (K-N) because one could stop deliberations about it. In short, anomalies in the known world arise from our inability to affirm on the available evidence. **Syad-Nay** entertains all such valid concerns to reduce doubt through affirmative reasoning.

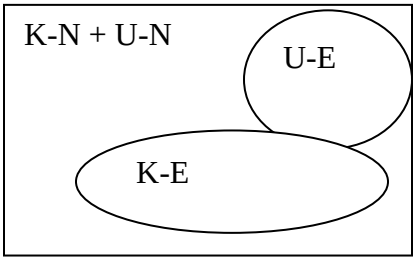


Figure III-2. Venn diagram for the states known and exists (K-E, oval), not-known but exist (U-E, circle). The other space is for known not to exist (K-N), or not known not to exist. The rectangular boundary marks the universe that obeys rules of reality, i.e. it can be examined, conceived, represented and shared. Contradictions lie outside real worlds.

Conceptual tools for the orthogonal slices. Multivariate complex worlds are explored through multiple criteria. If Tao stands for real world certainty, it is echoed (Lao Tsu ca. 300 BCE) as:

The Tao begot one.
One begot two.
The two begot three.
And three begot ten thousand things.

For wading through complexity we need a plan. It must include real world attributes and criteria (Volume I). The search moves forward if these can be asserted in orthogonal ways that can be independently addressed by separate evidence.

The Syad syllogism. Multidimensional search increases the reliability of inference. The process can be efficient if strategically applied. For a particular concern consider:

(a) An assertion A (*it exists*) that can be affirmed (A+) or not-affirmed (A-) on the basis of independent evidence.

(b) An orthogonal assertion B (*it does not exist*) that can be affirmed (B+) or not-affirmed (B-) on the basis of other independent evidence.

For the two assertions there are four possible outcomes:

(A+,B+) affirms the existence and also affirms the non-existence

(A+,B-) affirms the existence and not-affirm the non-existence.

(A-,B+) not-affirm the existence and affirm the non-existence.

(A-,B-) not-affirm the existence and not-affirm the non-existence.

The (A+,B+) is a *contradiction* of the kind that can not be resolved by any evidence. Such outcomes, of assertions of the kind *the God exists* and *the God does not exist*, are expected if the concern under consideration is unknowable or non-existent.

The other three outcomes have truth-value and therefore useful for decision making: Non-existence is consistent with (A-,B+); existence is affirmed as (A+,B-); lack of sufficient evidence is suggested by (A-,B-) which calls for continuing the search. As also suggested in the Venn diagram III-2, inability to affirm does not necessarily mean negation. The same hold for the converse, that is inability to not-affirm negation does not mean affirmation of existence.

Saptbhangi Nay syllogism. Bhadrbahu (II-9) introduced as third assertion C, i.e. whether the outcomes of the first two can be asserted in a suitable word construct. Thus affirmation (+) or not affirmation (-) of A, B and C has a total of 8 ($=2^3$) outcomes. If C+ is that A+,B+ can be uttered then (A+,B+,C+) outcome remains a contradiction. As shown elsewhere in this site the other seven

states have partial truth values. (A+,B+,C-) amounts to God exists, *and* God does not exist, ***and*** god cannot be expressed in words. In other words, such a conception can only be a matter of faith or personal knowledge however it is not an expression of reality. Of course, we could deny the known reality and believe that god does mysterious things in mysterious ways. Another way of rationalizing would be that randomness is incomprehensible because there is no information there to comprehend. Such inferences based on the (A+,B+,C+) outcome kept the contradiction of omniscience out of intellectual discourse.

When do we have a valid theory?

There is a modern version of the Saptbhangi syllogism. There are three criteria for a reasonable theory: Consistency (*is so*) with (A) logical elaboration, (B) available facts, and (C) the rest of the reality (that we assume to be the case). With affirmation (+) or lack of affirmation (-) for each of the three criteria there are a total of eight states. Out of these, the state (A+,B+,C-) is the one that is consistent with the facts and is logical in its elaboration, but inconsistent with the rest of the reality. It signals a fundamental contradiction, and is not worthy of further consideration. All the other seven states have at least some validity and therefore useful of further consideration. The most valid of these, i.e. logical in its elaborations and consistent with the available facts and also the rest of the reality (A+,B+,C+) is also the most valid guide that is judged as "truth" to the limits of "all ravens are black" (III-17). The other six have elements of doubt about the facts or logical criteria or about their relationship to the extant reality. All of which are worth exploring because anomaly appears only against background of a disciplined matrix. It may call in question any one or all of the three criteria.

Beyond the realm of logic? Thought processes could be represented as matrix of possibilities. The approach of Bhadrbahu also illustrates the significance of considering orthogonal assertions, and also shows that the number of outcomes with partial truth-value increases dramatically with the introduction of assertions based on additional orthogonal criteria to be evaluated with *independent* evidence. For example, $2^4 - 1$ (= 15) states of partial truth functionality exist for 4 assertions, and $2^{10} - 1$ (= 1023) for ten assertions. For example, if there are six independent assertions about a beast from the perspective of the six blind persons, there will be 2^6 (=64) possible inferences ranging from contradiction to total consistency. If all of the assertions are properly worded at least one of the outcomes would be an identifiable contradiction. Discarding contradictions from further consideration is the most important step in decision making. Therefore it is useful to look for assertions that expose contradictions. The rest can be evaluated on the weighted average basis to reconcile the difference between the assertions.

All-knowing computerized robot?

Let us explore the limits of affirmation for n orthogonal assertions with a total of 2^n combinatorial outcomes. Out of these, one is the null set that is just outside the logic space i.e. it contradicts the reality. Also there will be one set where all the assertions are valid. All other inferences are partially valid. So the issue is how to search for that all-valid set? Can a super-computer help in the search? The task of sorting out an inference consistent with all of the valid assertions becomes increasingly difficult. The number of combinatorial possible states with partial information increases geometrically with the number of assertions. For example, resolution of all possible combinations

resulting from 300 assertions would take about one billion years on the fastest conceivable computer of the size of the known universe. Rest assured, there is no omniscient robot out there that is controlling all the happenings even in a single human brain.

In fact, this Syad-Nay dissection of suitably worded independent assertions about a concern is one of the simplest demonstrations of what is known in mathematics as the Not Polynomial (NP)-complete problems. Such problems do not have a general solution, although a solution can be checked for being correct. On the other hand, it is quite difficult, if not impossible, to prove that the solution is the most efficient solution. There are many real-world problems of this class.

A matrix structure to guide thought, reason and arguments on the basis of defined criteria is a remarkably effective way to develop an initial understanding of how to deal with complex system. Such insights about the lay-of-the-land (logic space) provide a good illustration of the effectiveness of the deterministic range of the reality-based statements rooted in a few relations (operators) and criteria applied to the observable. As pointed out above, often the trade off for the information assembled in the probabilistic domain comes with at a cost. While such issues are readily illustrated through the device of truth table, the syad and saptbhangi states clearly illustrate a need for deeper understanding. In order to access the algebra of the higher states in the deterministic domain, Professor Ramachandran (1979) has developed algorithms for the origin of other states of doubt, and shown that such states emerge from a novel matrix form of higher order Boolean Algebra. It is available in Vol IX in the Nay section.

Node for representation: Two of the interpretations of zero are: Zero as a node between the positive and negative rational numbers, or as a 'filler' in the place based decimal numbering system. In the Boolean logic 0 is a lack of 1 or existence of the represented reality of the binary world. Nothingness of zero goes even further in the Nay reasoning: Zero is a lack of anything tangible, i.e. anything that occupies space, or changes, or interacts with other entities, or responds to manipulations and operators.

Within such confined 'nothingness' of zero becomes a node for **representation.** It is also a null point against which the logical reality is represented one side, and the state(s) of contradiction on the other side Imaginary worlds?). This *nothing* is not *anything real*, and it does not contradict or modify reality. On one extreme the nothingness or zero is one of the limits in the limitless space. In short, as a node nothingness is intertwined with the conception of reality, as well as the infinite, imagined and contradictory. At this level "node" is a point from which the logic space can be charted in of the real and imaginary worlds.

In virtually all aspects of Western thought the node of representation is chosen ad hoc. In the Aristotelian system it is built into the assertion that "not-yes is no." The Euclidean and Cartesian systems define the point of intersection of the 'axes" as the origin. In Syad-Nay, the node the representation of reality is nothingness that dis-associates the boundless universe into real and imagined worlds which necessarily have limits imposed by their own rules of representation.

Rules of representation provide suitable basis and tests for validating assertions. If a new assertion does not lead to at least one contradictory state, then it is not relevant for the world of the concern to provide an orthogonal and independent valid inference. Assertions that can not be affirmed by evidence are

either irrelevant or self-referential to what is already built into the concern.

In closing it is worth pointing out a broad conceptual issue for representation and the world-views that follow from it. By avoiding contradictions the search space always remains within the logical bounds of viable alternatives (*anekant*) and also subject to doubt (*syad*) that can be addressed on the basis of evidence. The process moves forward with a full realization that the search may never be complete (far too many variables), it also avoids dead ends of contradictory beliefs and detours of inconsistent choices.

Other kinds of doubt, uncertainty and relativism

(a) The debate about wave-particle duality of light and electron was guided by looking at the microscopic world though a macroscopic lens. The problem was resolved once it was realized that both the behaviors are intrinsic in particle of that size.

(b) The Heisenberg Indeterminacy (often improperly referred as uncertainty) principle about the position and momentum of an electron and its mass in the orbit of an atom invokes that certainty for one measure increases the uncertainty for the other measurement. Here the probabilistic certainty is expressed as a smeared out (cloud) view of an electron.

(3) There has been a tendency to interpret Einstein's theory of relativity as the philosophical relativism to characterize ***anekant*** (logical alternatives). It is not correct even as rhetoric.

III-25. Science-based Conduct?

Science is a way to teach how something gets to be known, what is not known, to what extent things are known (for nothing is known absolutely), how to handle doubt and uncertainty, what the rules of evidence are, how to think about things so that judgments can be made, how to distinguish truth from fraud, and from show.

- Richard Feynman

Not long ago, in a magazine somebody wondered out aloud: "*I find that science never validated Jainism to the degree I needed to convince myself....*" This sentiment is not much different than that expressed by Queen Juliana of The Netherlands: "*I don't understand it. I don't even understand the people who understand it.* Is it a praise that is not convincing or a condemnation from nowhere? I guess it is matter of mixing cultural metaphors of perceptions.

In most ancient cultures world is a process rather than an object. Mothers of Kabuli tribe of New Guinea emphasize words for requesting or offering, but not the objects. American Indians teach their children to be silently respectful. Middle class American culture places a high value on precocity, display of knowledge, and on competing for answers.

Science and technologies are egalitarian and democratic pursuits by the participants. On the way to internalize shared knowledge, for good or bad, thick descriptions of science and tools of the technology challenge the essential of a person at the center of perceptions. Beliefs are for self-validation that calls for interactions with reality. The ad hoc and mis-represented stifle.

The quality of perception depends on the inputs (method) and criteria as well as stages of personal, intellectual, social, and ethical development.

Since science is part of the human behaviors the very thought of validation of human behavior by science is misguided. Behaviors are validated by practice. Scientific methods are useful for evaluation of the outcome. The basics of science invalidate certain assertions about the reality as the contradictory states. At this level science is about toy-problems and thought-experiments that extend the reach of mind in the plane of objective reality.

Thick-descriptions or hermeneutics technique of science may challenge the essentials of the individual, but that is not the purpose. As is clear from the scientific justifications and rationalizations from the human history (III-14, 15, 29-31) bad-science is no substitute for no-science. And methods and results of science are aids for making personal choices, decisions and judgment calls. It can hardly be over-emphasized that use of knowledge in the affairs of man requires judicious choices without submitting ones own responsibilities. Choices of the market-place may be attractively packaged, however it is prudent to make choices for their utility.

Behaviors are evaluated by outcomes: Reality-based facts, choices and decisions guide behaviors. Science can be helpful in weeding out premature-, pseudo-, quasi- and omni-sciences. Yet useful behaviors and guides evolve long before the scientific basis for the practices are known:

- Nonviolence for conflict resolution was practiced long before the ideas of survival instinct and health consequences were articulated.

- Health and other benefits of vegetarian food habits are beginning to be scientifically articulated For example, compared to a pound of pasta or bread, a pound of red meat is responsible for 20 times the land use, 17 times the water pollution, 5 times the water use, and 3 times the green-house-gas emission.
- Safe drinking water (filtered and treated) was used long before bottled water became a wasteful fad.
- Negation of certain behaviors as social norm came long before the concept of law and justice was formulated.
- Negation of alcohol and tobacco came before their adverse effects on human health were established.
- Effects of excess empty (malnutrition) caloric (potato and sugar) intake were noted long before concerns about weight gain and obesity came to be touted by the medical community.
- The word democratic may not have been in public consciousness, but diverse inputs and rule based methods for dealing with doubt are at the root of virtually all lasting and enduring institutions. Shared goal thrive only in such environments.
- Nothing stays under wraps for ever. Importance of quality, integrity, honesty, and admitting failures in open dealings is widely recognized way to success. Only fools rely on secrecy to stifle truth.
- Even when scientific evidence is established, not everybody practices, or even appreciates, the significance of behavior modifications.

It is not easy to spot contradictions. How many people can spot violation of: material reality cannot be created or destroyed;

everything tangible in the time-space-concept continuum is finite; real world entities obey rules and criteria for representation that are explored with questions that begin with what, when, where, how and others; law of conservation of matter, energy or information. Unless one spot such violation one can not stop believing in stripes of omniscience. People do not seem to abandon behaviors even when it is clear that the belief does not work.

Medical costs

Great advances made in medicine during the last few decades are available to those who can pay. Heroic measures to deal with acute episodes have raised the average life expectancy in US by about 75 days at a cost that is 75% of the total expenditure on all health measures. More significant advances (over the last 100 years) that have reduced mortality and improved the quality of life for many more at a much lower cost are in preventive care with better nutrition, exercise, breast-feeding and other traditional practices. Such behavior modifications called for curtailing abuse of food, medicine, drugs, alcohol, tobacco, sugar, caffeine, and wars. Of course, these are long-term measures. There are many beneficial short-terms measures that also call for modification of habits, such as getting enough (but not too much) sleep. When do people pay attention?

Why do we not heed? With an emphasis on the ever increasing resolving power of our means and methods, tremendous progress of modern science remains focused on the validation of testable reality at all levels of organizational and mechanistic hierarchy. This is justly so. One cannot conceive of another way to the reality based practices.

A limitation is implicit in the practice of science. Although not explicitly acknowledged in the scientific methods, it is a method of after the fact analysis. Scientific conclusions are rarely made on the real-time basis. There is luxury of repeating the observations to assure their permanence. In this sense the practice of science of is an artifact of isolated reality where the distinction between past, present and future is intentionally blurred in a probabilistic description. Albeit it is a reliable artifact which can be used in the deterministic world of living individuals provided relevance is found and established in their perceptions.

From the analytical perspective the challenge of what an individual represents for itself is far more ambitious. It requires guiding the particular of the past and present behaviors for the future in real time. By relying on the consistency of a set of assumptions about the nature of reality, we can develop and entertain consistent models to guide future behaviors. However, both the assumptions and the inputs for the model depend on the real-time constraints and perceptions. Science does not deal with such issues, except in the realm of probabilities. Scientific methods do not and should not dictate individual behaviors. Decisions and responsibilities for individual behavior lie with the individual. Of course, individuals may choose to use scientific knowledge and methods to arrive at a meaningful behavior. Unfortunately, even when armed with adequate knowledge, most people refuse to act rationally.

Study of the real-time individual behavior is also outside the realm of science. Such studies would require constraining the individuals and their actions. Also information about the behavior of a single individual is not very useful. It is like starting rumors based on a single unverified sighting. Information from the study of groups of individuals can be used to predict future

behaviors of a comparable group. Improving reliability of the prediction requires knowledge of all the inputs and rules of the game.

Then the rules have to be applied correctly in the suitable deterministic context. This is nearly impossible even for a simple physical or non-living system. Scientific information on group behaviors is probability based. In the modern game-theory sense we can improve the chances of success through certain behaviors. Such models do attest that reliance on the reality-based facts about the situation is far more desirable than taking risk of random success with a single try. A trajectory of acts, amounting to a goal directed action, improves the chances of success. Enlightened social institutions and home environment also paves the way. Yet in the end, the decisions lie with individuals.

It is a matter of perception. Real-time events rarely offer luxury of looking back. Invariably decisions to act, or not to act, have to be made on short notice - that too with incomplete information. It leaves little time for real-time analysis of strategies and consequence evaluation. With such constraints real-time decisions are guided by perception of the unfolding events coupled with the perceptions established from the prior experience. Since such a decision always amounts to risk-taking, the main issue is what is at risk.

We are beginning to make progress in understanding what shapes our behaviors. With increasing resolving power we know of many in-born limitations to human abilities and skills. We also know of environmental risk factors and social experiences that influence or interfere with normal functions of living organisms. The nature versus nurture debate also continues. In spite of impressive progress we hardly know what we need to know to

address such issues. More to the point is the question, can we benefit from what we know? Certainly yes if choices are made for provision with mid-course correction. Should the society make decisions for you? Certainly not.

Dark corner of non-linearity. Individual concerns do not easily yield to generalizations. Also richness of choices can conflict with individual conscience and insight that takes us out of morass. It gives a novel meaning to the paradox: *Nonlinearity giveth chaos, and nonlinearity taketh it away.*

Behavior is a response to large arrays of concerns. Such systems can only be handled empirically, whether through the evolutionary lessons, the market forces, or the numerical models, or computer simulations. In the end these are the exploratory tools – like a flashlight in darkness. Insights into the modular choices can come from theories, observations, or practice. No matter where we perch on such issues, no one else but only the individual can make a decision about their suitability.

Of course, we will be better served in our choices if we are not brain-washed with barrage of propaganda and self-serving pronouncements. That is unlikely to happen in the battle for your pocket book and resources though your mind. It is the mind that guides us through the maze of events and choices. It will remain relevant as long as we believe that we can influence consequences of our behaviors.

Learning as a non-linear action. All aspects of how we learn are not known. What little we know is based on our own personal experiences. The rest is from the psychological studies with rats, monkeys, school children, and college freshman. These descriptive results at best identify the mechanics. Are you surprised?

It appears that whether or not we acknowledge virtually all of our lives are spent learning and we learn with every act. We learn even while asleep or making the same decision again based on known facts. Learning is a way to deal with the tentativeness of our perceptual grasp of reality that changes every moment of our life. That is why decisions change unless we totally succumb to our habits.

Do all people learn the same way? To appreciate the role of inputs and assumptions in active learning considers: Are all tasks learnt the same way? When do things go wrong? Why do such attempts fail? Do we use what we learn? For better appreciations consider the choices we make for food, health or choosing a mate. How often are we guided by the best available knowledge? Are such choices dictated only by rational considerations?

Together, there is ever present need to address doubt and certainty to chart behaviors. It is part of living, and necessary to thrive. Chances of success improve if our motifs are verifiable and real, if we apply reality base criteria to defined attributes, and nothing else. Centuries ago this approach was useful to fight hegemony of ad hoc. It is also at the root of scientific methods that we can hardly live without.

Chaos ways of sciences

* Invention, strictly speaking is little more than a new combination of those images that have been previously gathered and deposited in the memory.

* Conceptual understanding is powerless to correct or modify even clearly bizarre perceptions. What goes into a world picture is a matter of beliefs. Logic can not compel belief in a real outer world, or in a pre-established harmony between thought and

things, or in an asymptotic coincidence of the world picture and the real world (*Max Planck*).

* Experts give their opinion not the objective opinion. Experts are searching, they do not know (*Morarji Desai*).

* One does not have to believe in an equation to use it. Belief has nothing to do with truth, and beliefs are closed by virtue of aesthetic considerations. There is enough mystery in the content so as not to create mystery of semantics (*Joseph Berger*).

* It is not contrary to reason to prefer the destruction of the world to the scratching of ones fingers.

* So irrelevant is the philosophy of quantum mechanics to its use, that one begins to suspect that all the deep questions about the meaning of measurement are really empty, forced on us by our language, a language that evolved in a world governed very nearly by classical physics.... The more the universe seems comprehensible, the more it also seems pointless (*Steven Weinberg*).

* Any mingling of knowledge with values is unlawful, forbidden. (*Jacques Monod*)

* For nomination to Prussian Academy, Max Planck summed up Einstein's contribution as: ... *in the spirit of know-nothingness, we need to reexamine fundamental concepts that invoke that light behaves as a wave and as a particle. His hypothesis of light-quanta (later called photons) cannot really be held too much against him.*

* Do not talk a talk if you cannot walk a walk (*a Vermont saying*).

* The scientist has a lot of experience with ignorance and doubt and uncertainty. We take it for granted that it is perfectly consistent to be unsure - that is it is possible to live and NOT know (*Richard Feynman*).

III-26. Philosophy and Logic for Action

Never doubt that a small group of thoughtful committed citizens can change the world. Indeed it is the only thing that ever has.

- Margaret Mead

Decisions for rational behavior require perception to turn isolated acts and parts of knowledge to generate a trajectory of action. Strategies are needed to reduce the level of doubt and eliminate contradictions. The underlying concept and dynamics is best appreciated through an ancient parable. Practice of principles identifies and recognizes limitations of the extant reality. Beyond that deeper human insights create value out of the prevailing reality and achieve potential. It is in our interest to assure integrity of the key ideas as well as the process through which viable ideas evolve.

If the concept of a concern is a part of the shared experience, that is a useful starting point as one strives to know, know to understand, and understand to judge. For a suitable representation we assert with parts, and verified assertions are integrated to represent the whole. Valid assertions are grounded in the physical reality accessible to the senses. Yet our interpretations, inferences and perceptions are often colored by the experience of all those who interact in the process of representation.

Information conveyed by an assertion is necessarily partial, incomplete, and doubtful, and hopefully not inconsistent with what is known about the world. Multiple assertions about a concern are helpful in reconciling independent facets of available information. We conceptualize within this landscape.

An Ancient conception of conservation Principle

In a book from 11th century CE, Rishabhnath (ca. 2700 BCE) is credited with the insight:

उपप्पानेई वा विगमेई वा धुवेई वा

As a conceptual template it has several interpretations:

- Above all it rules out something for nothing.
- In the ordinary literal sense, it is a simple economic accounting: the net gain (*dhuvei*) is related to what is produced (*uppanei*) and what is spent (*vigmei*). It can also be extrapolated to the supply and demand relationship to the price, or risk and reward for an action.
- Note its correspondence to the Second Law of Thermodynamics: The total change in the energy of a system is the sum of the energy conserved as useful work and lost as the disorder (entropy).
- For the reasoning it invokes that new evidence reinforces an argument.
- It acknowledges a limitation of existence of all entities and the resources on which we depend.
- In a finite world sustainable growth is not possible except by creating value by a qualitative change.

Accounting to identify the unknown.

The known can be accounted for in terms of the input and outputs. If there is any unknown that will also influence the balance. On the other hand a nonexistent will not have any effect on such accounting. Consider the thrust of the following:

Gandhar: Can *tattv-swarup* (the intrinsic reality) be known (represented) with what we know about it (*gyan*) or from what we do not know about it (*agyan*)?

Mahaveer: Certainly, it is not possible without what we know about it. However to see the whole (the known and the unknown) it is also necessary to know what we do not know.

What we know remains incomplete until we also know what we do not know. That is complete accounting. A rational path for the search for the unknown begins when it can be bounded by establishing what ***it is*** (*asti*) and what ***it is not*** (*nasti*) on the basis of affirmative evidence. Implications are not sufficient. As also developed before, orthogonal and independent assertions are also useful to explore the plausible alternatives. Anything that is not existent would not show up in such accounting.

Reality based algorithms, syllogisms and criteria for the evaluation of beliefs avoid traps and detours. What is not asserted becomes significant only if what is asserted is based on rigorous evidence.

III-27. Actions That Matter

They call war an art, but it isn't. It largely consists of outwitting people, creating and then robbing widows and orphans, and inflicting suffering on the helpless for one's own ends - and that's not art: that's business.

- Kenneth Roberts

Actions often have consequences well beyond the recognized and immediate outcomes. Pragmatism lies in doing something about those that matter. Such choices are useful for what we can and also for what we can not do. Having choice goes with the responsibility for the consequences for ones own actions. It is a positive and secular attribute of being human because it frees mind from the grip of the unknown and the unknowable.

For the next step consider some real examples:

- Bad behaviors of parents show up in children.
- Watching violent shows on TV at the age of 5 is correlates with the behavior problems at the age of 15.
- Cigarette smoking is correlated with lung cancer.
- As for the second hand smoke: When a town in Montana banned public smoking, the number of heart attack cases coming to the hospital emergency rooms decreased by 50% within 3 months.

Are these coincidences? Does one behavior reflect the propensity for the other? Is it causal? How can we be sure? We do not know the answers. It should not prevent us from taking necessary measures. Taking charge of what is consequential call for empirical search.

Justification against death penalty

Several recent cases from USA illustrate an unusual aspect of the issue. On re-examination of the evidence on which convictions were made, students of a Law School found that out of the 24 inmates on the death-row in Illinois 13 were convicted of crimes that they had never committed. As a result several states decided to stop human executions, and review all such cases.

Considering the survival instinct, generally there is an innate revulsion in all living beings against violence, at least towards their own kind. Virtually no animal kills other animals for anything but for food. Even the primates are not as aggressive as were once thought to be. To overcome the instinctive revulsion one needs regimentation of faith and fervor to indoctrinate (brainwash) people into killing each other. Even a chicken or dog can be trained to be a killer.

What happens to that innate revulsion? Clever guises have been devised to put a distance between the mayhem and the individuals who cause it. Through elaborate means individual is marginalized to *see nothing, think nothing* zombie. In the life of those who are already marginalized, nothing works better than a *higher purpose* such as being on the right side.

When do our actions commit us to the consequences? It is the *karm-bandh* that literally mean *bound by consequences of actions (of your own and others)*. It calls for actions based on the certainty of the outcome rather than belief. Irreversible outcomes are to be avoided, so also those with lasting and unpredictable consequences. Irreversible acts are rarely isolated single events. They set course for a trajectory of consequences.

III-28. Tragic versus Tragedy

Do the right things, not because of any rewards, but rather to prevent any regrets.

- Advice to a young Samurai

Things that matter most are often unplanned. Consequences that come to haunt later are often unintended. Even the best laid plans fail, actions have unintended consequences, and decisions go awry. In unknown complex worlds, to err is human. Errors are essentially random. They crop up here and there, now and then. Errors are necessary part of doing the business of living. If errors work out in favor we call ourselves fortunate. Brushes with disasters to see another day are called miracles.

Errors are not mistakes unless they assert repeatedly. Unfavorable chaotic outcomes of deliberate actions are characterized as mistakes. Chaotic consequences are acknowledged as the tragic. Some mistakes are predictable and their tragic consequences can often be avoided. Can our own mistakes be used to our own advantage? When do errors become mistakes?

When do tragic mistakes turn into a tragedy? Tragic and unexpected consequences are part and parcel of chaotic human experience. Tragedies seem to last for ever. Tragedies are made up of unintended and uncontrollable consequences. Inability and inaction to do something to do about such consequences when there was opportunity is the central irony of a tragedy.

Tragedies follow a trend towards undesirable and adverse outcomes. Tragedy emerges as certain mistakes and tragic outcomes reinforce each other towards increasingly severe consequences. Tragedy emerges if we do not mend ways: mid-

course corrections to curb actions, control underlying momentum, modify behaviors behind the mistakes. Such experiences morph into a tragedy when the action consequence cycle becomes uncontrollable. At this point one can not seem to stop even when one knows that that is the most desirable course. Often one begins to accept tragic outcomes long before tragedy is inevitable. It is not just the stuff for epics. Even in ordinary lives, run-away tragic events take epic proportions.

Motives guide perceptions to goals

A parable goes like this. Consider the thoughts and reactions of six people looking at a tree laden with ripe fruit. Depending on the need, interest and motives (*lessa*) their thoughts may range from picking the ripe fruit on the ground to chopping down the whole tree without concern for the future of all those who depend on the tree. Clearly, at least one of these is a scenario for tragedy.

What is a prudent course into an unknown future? Reactions are instinctively guided to minimize regrets and maximize utility. Attention to and actions with feedback are guided by motives, and perception of the goals. Chances of success increase if decisions adhere to the reality on ground. Beyond that prudence is about avoiding irreversible actions that destroy value including violence against feelings, thoughts and ideas. Such acts not only decrease potential resources, and resulting behaviors are a hallmark of tragedy.

Live and Let Live, and Thrive. Wed of life is far too complex to be constructed in the context of an individual or a species. The men-centered constructs, such God created man in its own image, threatened sustainability of many. It continues to have tragic consequences for large parts of biodiversity let alone diversity of

ideas, practices, thoughts, cultures, and gene pools. Such practices accentuated by over consumption have now brought us to the brink of the potentially disastrous consequences of Global warming. In the web of life the well being of one depends on the well being of all, and the vice versa.

Prescriptions for personal behaviors: Consider the following prescriptions suggested 3000 years ago for personal behaviors. Avoid:

1. Destroying humans and other life forms
2. Wishfulness that amounts to violence against reality
3. Stealing what belongs to others
4. Meaningless relationships that distract from the meaningful
5. Possessions that begin to possess the possessor.

These are the prescriptions for dealings and interactions that create confidence in social order. In the game-theory sense such behaviors of individuals in a web are likely to evolve into a meaningful social contract. According to John Forbes Nash (Nobel Prize winner for Economics in 1993), such a cooperative situation has greater utility than that delivered by the Adam Smith type of raw capitalistic scenario in which every person maximizes his own gain.

In dealings with other people, a meaningful dialog for a rational course of action can be initiated only if the parties facing each other do not feel threatened for survival. Nonviolence is a rational basis as shown by Gandhi and understood even by the British. As is well known now, Gandhi's search for truth by nonviolent means is now generally considered to be a preferred method for international conflict resolution. *Saty-agrahis*, the Gandhian volunteers, lived in their communities according to their principles, i.e. to be the living examples of: Talk a talk on which they could walk. In recognition of the insight about

rational behavior through nonviolence and truth, it is interesting that while Einstein epitomizes rational knowledge and Gandhi epitomizes rational conduct, the conditions leading to the rise and fall of Hitler epitomize the irrationality of the prevalent international political relations. Such tragedies of belief based principles and practices are not just the subject of epics. They provide a context for what can go wrong and how easily.

Omniscience as *malady of interpreters*. Behavior changes are brought about in stages through consequence evaluation. Behaviors are sustained through continuing practice as a part of utility maximization. Institutional beliefs often distort behaviors with other motives. Resulting behaviors are chaotic as they become *malady of the interpreters*. As for being right, yes even a broken clock is right twice a day. Probably for such reasons you need to perform three miracles during the lifetime to be ordained as a Catholic saint. Clearly, it is much easier to be omniscient if people forget what else you said before and did not work.

As an acknowledgement of our own limitations, we seek prescription of worship of something more than human, even if it violates reality. It is also true for all objects of desire and influence whether it for knowledge (omniscience), power (omnipotent), possessions (infinite and limitless grace) or beauty (diva or *devi*). Like perpetual motion machines and other demonic devices such idealized contraptions of thought are also unreal. As objects of our desires they become Platonic platitudes where the thoughts cannot be put even in words. Self-referential words are invented for such idealizations. Tragedy is that such words that lack constraints of reality also distort reason.

In closing, no man is an island. We rely on knowledge, technology, tools, and devices from the past. Possibly, far more powerful are the influences that shape our attitudes and approaches towards creating value and meaning. Such goals are intricately tied to criteria and processes for verification of the facts, objectives, inferences, who to trust, and also by our abilities to examine validity of evidence, assertions and arguments. It is shared search. Tragedy strikes when we try to cut it short with authority of ad hoc and universals.

III-29. Representation of Order with Room for Doubt

Mahendra Kumar Jain: The Quarterly Review of Biology Vol. 78, June, 2003, p. 203-207. A Review of: **A New Kind of Science b**y Stephen Wolfram: Champaign, (Illinois): Wolfram Research.

Author claims that this book will be the foundation of "a new kind of science." It is possibly justifiable as a claim in the form of a 1200-page advertisement about the enthusiasm of the author. Whether it receives a critical scrutiny of readers or not, I am sure it will find a place in most libraries. The book is "heavy" on hype and weak on guiding readers through the conceptual foundations. In any case, it is a kind of mix from which myths of marketing successes are made. The book is about generating patterns. Wolfram's perception is that these patterns, derived from defined rules, help him "see" the origins of the seminal issues: patterns in biology, laws of thermodynamics, Godel's incompleteness theorem, free will, and much more. The insights are certainly about representation of reality and its potential. That is what science is about. The idea of representation to extract the potential of reality is not new. Also, all methods potentially contribute, especially if we do not know what we are looking for.

Thought is about processing the perceived patterns of matter, energy, and information. History of human thought is about plights and platitudes for the representation of parts of perceived reality. Since the dawn of the Stone Age, almost a million years ago, "New Age" of human expressions has appeared many times over. Often, each age and "new order" coincides with the arrival of new technologies. Wider dissemination of

technologies provides ever more ways of representing human concerns and insights. Useful representations enhance valid perceptions of shared knowledge to facilitate transition of thoughts into words and actions to address the concerns. In the process we discover Gods of things - big and small. With our zeal the better mousetrap is hailed revolutionary. But in the end, imageries and its products do facilitate perceptions of shared concerns.

Having said that, the work behind this volume and its antecedents are promising. Its conceptual core is based on the premise of Rule 110 of the Cellular Automata formalism for modeling the behavior of defined entities in a matrix. For obvious reasons, the use of computation to explore this conceptual space has grown during the last 30 years. Two key developments are critical here: Cheaper and more accessible computing power, and the realization that the traditional modeling methods have reached an asymptotic limit. Yet, from the book one would not gather that the ideas and conceptual framework have been around for centuries. They are also intrinsic in works going back several millennia.[1]

The computer-aided approach of Wolfram, at a simplistic level, is about the use of certain algorithms (available on several web sites) to visualize evolution of the behavior (patterns in a matrix) of defined bits and pieces. The approach bypasses the limitations of the more traditional analytical approaches where the equations are coded to harness the computer as a workhorse. The criteria and relations for the computing operations are built into the properties of the pieces and the programs. Computers can faithfully and reliably carry out thousands of such transformations (steps of operation within the program). The end results are remarkably enticing sets of visuals - a matrix with a

mix of short and long-range order and disorder. Beyond this readers are on their own for finding the real world significance of what they started with and represented with the rules of their choosing. For example, the matrix may relate to distribution in space, or to the evolution of the patterns in time. To be fair, this theme, and the limitations that follow, apply to all tools of representation, including pottery, alphabets, brushstrokes, numbers, and a myriad of ideas about charting a rational course through the chaos of the observed and perceived reality. After all, if the defined pieces are based on reality, the potential lies in the abstract or what follows from the pieces. From there on it is the game of exploration limited by the level of observer-observed interactions. On one range of the scale it may lead to paradoxes and contradictions, and on the other to a valid perception of the "entire" reality.

How do we learn to realize the potential of a conceptual development? It happens very slowly. In the process, the representations often deteriorate into mere conventions and rituals. For example, consider the fact that zero was conceptualized in the Ganga Valley of North India about 5000 years ago. Then as now, it represents "nothing." But the conceptual node for this abstraction lies in: nothing of something or simply nothing or absolutely nothing? About 800 years ago, the Arab traders introduced zero to Italy. Use of zero, and the derived place-based counting system, was not accepted by the Italian merchants. In fact, it was banned in Europe, possibly for the same "reasons" as the use of metric system is not accepted even now in U. S. As a few people began to see the merit of the place-based numbers, the use of ten digits (including zero) is now an almost universally accepted convention.

Yet, the conceptual significance of zero has not permeated the psyche. Consider the way birthdays are counted in U. S. and most European countries. Most people still count and express their birthdays as if the first birthday is the "zeroeth" birthday! Misperceptions of zero as "nothing of something" underlie several paradoxes that puzzled the ancient Greeks. For example, Zano's paradox results if one does not distinguish between the space as the infinite of nothing, and the universe as the finite of something. What is the difference? Universe will have a boundary – at least as far away as the light has traveled. On the other hand, space as the infinite of nothing (emptiness) does not have a boundary. Ancient Greeks carved space arbitrarily "as a place or a bowl" which is also a common dictionary definition).

In the Greek inspired thought, based on certain arbitrary criteria, the node is often set as an arbitrary zero. As the point of interaction of axes (the assumed Cartesian reality) the "origin" acts as the fulcrum for affirmation and negation. On the other hand, in the Nay "nothing" is synonymous with non-existent or emptiness of boundless space. This is a critical property that is built into definitions and starting points of the concepts and programs from which the worldviews emerge. Ad hoc modes of representation ultimately limit their utility. Representation of nodes calls for caution to entertain logical doubt and alternatives. To appreciate this line of thought, readers may also wish to mull over another related question: Can zero (nothing) be the minimum of anything? Defined criteria are used for a logical representation of the observed properties. As promulgated for several millennia[1] interpretation of the observed, and therefore of the represented entity, depends on the quality of the observer observed interaction. Confronted with something complex, novices may be tempted into thinking that the underlying mechanism must be

complex as well. This has kept us in the grip of omniscience. But the insight that the behavior of simple parts can produce complex behavior is not new. With this realization most of us have come to appreciate that we can take count of the universe in terms of the 10 symbols for the representation of the numbers. Of course, it is done with a full realization that it is only a representation - albeit a useful one. Elements of this approach are also built into the Euclidean theorems. Search for the underlying simplicity has also guided the experimental sciences out of the grip of the mind-set of alchemy. We have come to define the building blocks to peer into complexity. Be warned that we have dealt with artifacts of parts as well as the incomprehensible whole before. Such detours are integral part of the individual and collective thought processes. The Cyber Age dawned with the Boolean representation of the ordered universe. It is made up of only 0 (*nothing*) and 1 (*something* and *anything*). Cheaper computing power has created a tool for new ways of modeling more complex and dynamic systems. Many technologies for generating patterns have emerged. A hallmark of such methods is that beginning with a defined starting point (node); complex system emerges from relatively simple parts operated in a large number of steps with relatively simple rules. As many have pointed out before, far more information lies in the way a pattern grows and evolves during the computation. At this stage it is useful to consider the fact that the fidelity and efficiency of the biomolecular reactions is conceptually similar to the computation steps. As in biological evolution and growth, the results of the successive trials are based on the local conditions. This is akin to harnessing the wisdom of the ends, means, and paths.

Analytical representations of classical mathematics have been concerned with perfect order epitomized by equations.

Ancient Greeks were infatuated with symmetries and perfect shapes. Following such leads classical physics and engineering extracted useful constants and parameters from such conceptions. The approach has also guided modern physics, although disconnect seems to have developed on the way reconciling quantum and relativistic worlds. There is hope that someday the major questions in biology, an epitome of complexity, would succumb to such representations.

The realm of analytical deductive logic is of the perfectly ordered states: all pieces seek perfect equilibrium through steps in a defined order. Also, the rules do not change during the change of the state of order. But the real world is neither perfectly ordered, nor is it in a state of perfect disorder. In fact, such extremes hardly ever exist. For example, as a basis for the interaction of the matter with energy, the chaos lies at the conceptual foundations of thermodynamics. The Boltzman distribution of the states along the energy coordinates also follow from the chaos in the gases. In other words, counter to the adages of physical chemistry textbooks, even the behavior of gases can only be described in terms of local chaos. This insight also bears on the interaction of information because the Boltzman relation is key to defining entropy, which is also the basis for quantification of information. The information content of perfectly disordered state, the state with the highest entropy, is zero. So a critical concern would be if we ever start or end up at anything approaching such a zero. Since we do not have a measure of this zero node, we express only the changes in all such quantities or measures of energy and information.

In the other direction, if we have a defined end point in mind, the socioeconomic models and game theoretic approaches force convergence as a "goal." It is called the equilibrium or the

steady-state assumption. Beginning with relaxation of a perturbation, the path to a solution, as well as the goal, is built into the starting assumptions, such as the homogenized global conditions at the start and the equilibrium conditions at the end. Following the earlier leads, Wolfram has championed the use of the method that has come to be known as "cellular automata." A good part of the book discusses what follows from a very narrow slice of this world. Illustrations in the volume tell only the end result. Like the fractal representations for the search of order in apparent chaos, this genre of programs explore the balance between the extremes of order and disorder. Utility of such models lies in the fact that often the patterns converge to an order or diverge into a disorder.

The term chaos is useful to describe the real world complexity. It is often defined as the order interspersed with disorder, and vice versa. Although equations have provided insights into the chaotic world, a satisfactory intuitive and analytical grasp of such reality has not emerged. Traditional biology has celebrated the theme of chaotic order in complex forms (shell) and functions (symmetries, lifecycles). In the early stages, inferences from analytical approaches are intrinsically limited. However, the problem is addressed as more suitable representations of the whole emerge. Yet, a synthesis of remarkable simplicity has emerged at the level of the genes, protein structure, and function. Of course, many more complex systems and behaviors remain to be discerned, understood, and exploited.

Complex phenomena emerging from simple rules are widely recognized. It is the basis on which the universe is built with only 92 building blocks. In fact, much of the biomass is based on 10 elements. Even after 50 years, it is mind-boggling to

me that coding of the genetic information ultimately depends on the hydrogen-bonding between the base pairs in DNA. Self-organization of simple amphiphiles into membranes is possibly the first step toward evolution of the cell as building block for all life forms. Although the building blocks are now reasonably well understood, the unresolved other half of the genetic information is still unresolved as the problem of protein folding. The problem of emergence is also impressive from another perspective. The human organism starts with about 100 million specification in the genome that code for less than 30,000 specific functions. Yet, a developed brain can deal with information that would require millions of times more computer codes.

There has been considerable hype, hubris, and enthusiasm about the patterns of chaos produced through a variety of formalisms including the Wolfram's work. Without dwelling into such superficialities, or going into the underlying specifics, deeper concerns remain to be addressed about what such methods represent in terms of the formal thought. Current mathematics has the limitation of working within a rather strict set of rules. To assure validity, the trajectories of the assumptions, hypotheses and solutions are to be spelled out. Proofs have to be checked to assure that the logic space is unequivocally defined the way one intended to do in the first place. The process can be daunting, tedious, and time consuming. The devil often lurks in the details. For example, in full recognition of the limitation of human mind, and tribute to the scrutiny by the peers, the hidden assumptions in the Euclidean proofs continued to be discovered until the 20th century. The modern version of this representation is vastly different than what Euclid articulated and what has been taught to school children for the last 2200 years.

Cellular Automata and related methods for modeling patterns circumvent many of the problems of classical mathematics through computation tricks. It is too early to judge the liabilities of the method. Admittedly the whole process is reality based. The search trajectory does not suffer from the vagaries of the human perception. Still, one has to worry about what is built into the assumptions and definitions (starting points, nodes). Charting the logic space, built into the assumptions of the properties and the relations, is a slow process. Even the significance of the universals lies in the practice, just as "the proof of the pudding is in the eating."

Much of the deeper significance of the work of Wolfram lies in the fine print or what is not explicitly stated. In my opinion, it lies in the logic space of Rule 110 and some other related rules. The "programs" explored by Wolfram show that "simplicity begets complexity." The key finding goes well beyond reproducing pigmentation patterns of zebra or leopard stripes. Most classes of automaton converge into discernible ordered patterns, or fall off into abyss of randomness. Beyond these, Wolfram has identified the patterns produced by repeated application of the same rules to the Class 4 automaton that do not repeat themselves. The resulting pattern is neither regular nor completely random. It has some order, but the pattern is never predictable even when carried through a very large number of iterations. In short, the overall pattern is random by the statistical criteria, yet the pattern has some discernible order and trend. The result is surprising for a repetitive and deterministic process. Most of the ordinary mathematical criteria appear to have been adequately considered and characterized by Wolfram.[2]

To recapitulate, surprising though it is, the results are not unexpected. Wolfram's insight should be useful for the

understanding of the emergence of hierarchies, and also of the properties and behaviors that emerge from a hierarchy. The search through a thought process is guided by the belief that simple solutions can be found to complex problems. If the past is any guide, the cellular automata are not going to be the last method we will ever look for representing the worlds of our concerns. Strength of the cellular automata method lies in the fact that it builds on efficient use of the computing power for the evolutionary search. Many issues remain unresolved, and claims require close and careful scrutiny. Does nature follow the programs outlined by Wolfram? Are these unique solutions? Which ones are consistent with the yet undefined rules and assumptions? Do the rules have any relationship to the underlying reality? More to the point of representation, we described the universe with simple rules. Extrapolations and predictions built into the assumptions also follow from useful models. The approach is not conducive to, but it may even facilitate, the structure function search for the *why* and *how*. In the end, reality lies well beyond any representation. Only our perceptions fill the inevitable gaps.

Links to the ideas in the background:

1. See www.hira-pub.org for many of the ancient and modern ideas related to the representation of reality.
2. In a very readable essay, from the mathematical and computer science perspectives, Ray Kurzweil has examined and discussed validity of many of the Wolfram's claims.
http://www.kurzweilai.net/articles/art0464.html?printable=1

III-30. War Promises Meaning to the Otherwise Meaningless Lives

Meaningless lives seek purpose where they may be none. It appears far easier to remain true to war than to other means of conflict resolution. Does it work? One thing is clear: Only the dead have seen end of war and others live rest of their lives. This is not an original observation, nor the first voice of conscience. Physical and psychological scars haunt the survivors touched by war. With ever-increasing ferocity and potency as means of destruction through wars, religions and state try to legitimize each other.

Historically, premise of war to end all wars remains invalid. Such man-made upheavals are continuing thread of European way of life for at least last three millennia. Killing and chilling effects of war do not resolve a conflict. It was never an option but a necessity. That is the tragedy of wars to resolve conflict. If no-war is not realistic, war is also not a realistic option for getting-over-there.

Doubt is labeled as apostasy in wars presumably waged to resolve conflicts. Clouding issues with smoke and mirrors, fog, lies, concoctions, and flimsy excuses are the mainstay of wars. Language and sensitivity fall victim to propaganda. The survivors are left with the task of dealing with and speaking the unspeakable. In the end, only insidious self-doubt is aided by war. How to be faithful to which that seems so fundamentally contradictory? Voices of conscience (Tolstoy, Shaw, Kafka,

Borges, Levi, Gandhi) offer alternatives to come to grip with contradictory and chaotic aspects of human behaviors.

Wars at best postpone the day of reckoning by invoking authority. Wars encourage secrecy that destroys reason that thrives on plurality of thought in an open environment. Submission by violent methods does little to bring the warring parties to the table with equitable, fair and rational options. At best, violent means of conflict resolution are like overstretched rubber bands: Excesses over-compensate excesses as one does not use the same courts and rules to judge oneself as others.

Mass-destruction and mass-deception

In 1903 Rutherford and Soddy estimated that the energy released from radioactive decay might be thousands to million times more than the energy from the same amount of dynamite. Rutherford surmised *some fool might blow up the universe unaware.* To which Soddy remarked *the man who put his hand on the lever by which the parsimonious nature regulates so jealously the output of this store of energy would possess a weapon by which he could destroy the earth if he chooses*. The rest is the history of this marriage of power and fools. Dynamics of this relationship continues to dominate the contemporary international politics.

This chapter is my understanding of wars from a thought provoking book by Chris Hedges (2002): *War is a Force that Gives Us Meaning* (Public Affairs, New York. 2002, pp. 211). Another book of interest is *On the Natural History of Destruction* by W. G. Sebald (1996) and translated from German by A. Bell (Random House, 2003). Deeper analysis of the rise and falls of empires by Kannedy (1987) is still a classic that traces the transition from overt imperialism to strategies for the economic controls by the

European powers. Much of the discussion also holds for other means of empowerment such as religion, state and consumerism.

Strength of the narrative by Hedges is that it shows that irrespective of time and place there is much in common to all wars. He has articulated what people go through in wars and conflicts that have wrought unprecedented misery upon the countless millions during the last century alone. Wars continue to do so long after wars are over. As a correspondent Hedges has covered numerous violent conflicts. His perspective comes from first hand experience at the frontline. He also has sensitivity to look into it the day-after when the media reporters have moved on to other assignments. Dimensions of misery caused by wars are virtually incomprehensible to those who have not been there. And certainly numbed bodies, senses and mind of those who have been there is of little help: Nothing matches the real thing, not even the aftermath.

To put it bluntly, while few are celebrated in miles of tended graves, during the last century alone hundreds of millions of soldiers and innocents have ended up as fertilizers. Outcome of war benefits those who manage to stay at the frays of the game of the hunter in pursuit of the hunted. The beneficiaries of wars are crooks, despots, and scoundrels with corrupt motives for empowerment. The deprived and depraved opportunists see that war gives a better chance to better themselves by hook or crook. So much for the meaning in the lives of those who conduct wars.

Could it be that misery of being at the brink of death is the only way to bring meaning to life? Do people look for something incomprehensible to believe in? Such matters of pep-talk by the cheer-leader may possibly have an appeal to those with otherwise meaningless lives.

Hedges' hypothesis is that people become faithful to which provides meaning. Motivated by a call for repentance, his focus is on the not so uncommon perception that war unleashes a force that turns populations into canon-fodder for self-destruction. Do we long for carnage and destruction? A suggestion is offered in the book (p. 3): The enduring attraction of war is that *even with its destruction and carnage it can give us what we long for in life. It can give us purpose, meaning, a reason for living. Only when we are in the midst of conflict does the shallowness and vapid ness of much of our lives become apparent… And war is an enticing elixir. It gives us resolve, a cause. It allows us to be noble.* Is it the kind of ethos and pathos that permeates epic tragedies like Iliad, Ramayan or Mahabharat? In my own being, I have not felt a need to experience this kind of *high.*

Is the perception of such *high* instilled for social indoctrination? However, if not before, to most people the *high* seems very stupid once the *rush* is gone. A soldier write: *I went up to the post hoping for some action. But to have a shell land right on top of where you are, with the splinters flying, it scares shit out of you. Once you have been under fire, you never want it again*. Another stationed at this post at 22000 feet between the Himalayan mountain range was not talking about the physical beauty of the terrain as he sums up: *This is the most depraved thing I have ever seen. I don't know if this is war. But it is definitely hell*.

By some reckoning during the last 5000 years of the human history, there have been less than 30 days of no-war anywhere on the Earth. Yet, horrors of wars are beyond the experience of most people. As glorified and sanitized in the media, war is entertainment to numb human psyche. Even the non-fiction of the filtered narratives of conflicts and sanitized images of the ghastliness depict little of what really goes on. It is usually about

what the victors want you to know. The overall desensitizing effect of such methods and means is not very different than those of the graphic violence (Western, arcade games, X-rated fiction) that serves gore in the guise of fiction.

Cheer-leaders build on inadequacies. They thrive on barrage of moderately conflicting inputs. Most people can hardly recognize the underlying contradictions. Possibly for such reasons in times of malaise and desperation, war is a potent distraction that could possibly give a hope of renewal. At least that is the pitch that has been exploited by war-mongers of all stripes. All wars, with possible exception of the truly internal civil uprising and strife, seem to build on this false sense of a higher purpose coupled to the second-order pride in those who have little else to look forward to.

McCarthyism. These hearings by US senators were carried out in the climate of belligerent accusations and intimidations without any basis in fact. No one McCarthy summoned went to jail – even the few who were convicted won on appeal. But the probes ruined lives and careers with intimidation and unproven hints of taints.

Destruction of honest inquiry. Waging war on other people is often paddled as a necessary part of survival, security, and way of life. It is couched as a game, campaign, model, or ideal. Doing-the-job, as in dropping or loading the bombs, becomes the sole measure of the individual responsibility. With such rationalizations making the bombs does not appear much different than making toys or at least the toy guns. Myths are paddled by second rate intellectual inputs to find ways to justify

pillage, loot, burn, rape, and replace. Irrespective of the time and place, the devil seems to reappear and strike the unsuspecting.

What gets people hooked on to it? What is the cost of this addiction to war? May be because many people do not come to realize how exciting life is unless confronted with imminent death. In the end, real casualty of war is integrity, common sense, objectivity, moderation, independence of minds, and whatever meaningful existed before.

For most people war is mere spectacle - a kind of virtual reality in which lies of spies, spooks and sneaky guys do the smoke and mirror tricks. In real life we ask our 8th graders to be objective. Yet in this virtual environment we tolerate cheer-leaders built up as oxymoron of *tolerant bigot* or *intelligent hawk.* Intelligence for war is not about openness. How can there be intellectual openness if there is mindless conviction of faith?

War-mongers rely on rationalizations without accountability to whip up hysteria from white lies. For example, US senate overwhelmingly gave war powers to President Johnson who concocted the lie about the Gulf of Tonkins incidence. The incidence never happened, not even anything close to it. Exactly the same hysteria was whipped up thirty years later words of mass deception by Bush-Powell-Rice machine for the putative weapons of mass destruction in Iraq as a pretext for preemptive strike. No such evidence was found, not even close. Yet the lie was used to slaughter and displace millions more. In fact, willful lies are a common denominator to the excuses used to perpetuate wars. At this gut-level wars are motivated by desires for empowerment and economic subjugation to pass on the cost of an unsustainable way of life. Unfortunately, many wish to be persuaded by make-belief of a higher purpose.

Do the leaders know this? Certainly yes, that is why they lie. It is often difficult to tell when they are not being wishful-liars. No body lies all the time. If they did, nobody will ever believe them. Purpose of lies and fog of disinformation is to keep you guessing with a modicum of credibility. After all, believers believe because they want a chance to believe. Such *reasons* are invented as the talking heads (church, politicians, experts) create a consensus with buzzwords and astroturf. Content and critical evaluation is certainly not a part of equations to perpetuate the myths. The strategy is to destroy thought or even the context.

War suspends thought, especially self-critical thought. In such environment one fact appears as good as the next. Models of polarized dialectic and rhetoric for modern wars follow from might-is-right, and not the other way. Never-ending conflicts are motivated by thinly veiled self-interests and devious means of economic empowerment.

To further their cause, democratic states as well as the criminals and despots adhere to the fascistic fundamentalism of moral certitude of the agents of God. Even at the dawn of the 21st century we hear from the American president: *We go forward to defend freedom and all that is good and just in the world*. This is in the long tradition of pronouncements of evil empire, axis of evil, threats to freedom, manifest destiny and whatever else can be made to stick for the moment without regard to the facts or the consequences. With such words of mass deception are created messages, alliances, and axes of deception. Worse perpetrators tend to be those with enough weapons of mass destruction and arsenals to incinerate the globe tens of thousands of times over. **Prosecution of war entails willful lying**. At a subtle but insidious level self-doubt is aided by monstrosity of war. With the loss of eloquence, augments and plurality of though language

is reduced to cliché that blatantly challenge the innate sense of fairness. Machiavellians appear pale in comparison to plotters of modern warfare. Captain Ahab in *Moby Dick* appears rational in comparison when he says: *All my means are sane, my motive and my object mad*.

Legitimacy of wars is always concocted. Proselytizing, whether for faith or war, is meant to rob critical faculties of individuals and societies. Such activities have had long standing synergy. The blame-game starts by demonizing the other side. Ones own inadequacies are dismissed with platitudes of patriotism, appeals to racial superiority, and tribal DNA. More recent excuses are built in the name of international order, security, and way-of-life.

Secrecy and propaganda undermine the transparency of all processes. While hiding the self-interest, myths of *just and noble causes* are skillfully perpetuated to recruit cannon fodder. As self-aggrandizing gets upper hand in the propaganda machine, casualties of war are reason, truth, order, young, poor, culture, principles and institutions that safe-guard plurality of thought and action. To be convincing the process must start at the highest level and then chimed by all those who have been bought and wish to be counted. The cultural cloud and fog of secrecy envelops as the *coalition of the willing* with astroturf of the supplanted locals is backed by conspiracy of silence. Under these conditions, duped media has little staying power on real issues. People have short memories, at least so are they made to believe.

While hiding deeper interests and real motives, skill of plotting a modern war lies in building on the selective use of the world order to undermine the efficacy of the collective thought processes, control mechanisms, and shared values. Such moves are intrinsic in the rejection of the Kyoto accords, the International

court, undermining the United Nations processes, and effective disassociation of the flow of capital from the flow of goods, resources and labor in the international trade.

First offence calls for secrecy, shock and awe. Invaders are emboldened as they sense that they are unaccountable. It is more so as the histories are written and rewritten by victors. As the history of US suggests that even the most benevolent revisions do not undo the damage. Soul searching rarely influences behaviors of the future decision-makes. If politically expedient they might issue apologies. Yet the injustices by the victors are never corrected. As far as the cultures are concerned, once created, the rabbit-fences rarely go down.

Premeditated genocide: Just punishment and just war

Leaders, planner, plotters, and bullies often justify, or at least disguise, war as just cause and just punishment. In all such cases who is punished and who benefits is shrouded by message control. Even the precision guided ten-ton (20,000 pound) bombs hardly ever hit the leader wining and dining in their nuclear proof bunkers. Consider the carnage of bombing on the civilians. *Ponder what it means to have an entire city with all its buildings, trees, inhabitants, domestic pets, fixtures, and fittings destroyed. The remains of human beings are everywhere. Flies swarm around them, the floors and steps of cellar are thick with slippery finger-length maggots. Rats and flies rule the city. The few eyewitness accounts are ghastly, but not complete. In the midst of rubble, out of sheer panic, the population tries to carry on as if nothing has happened. No wonder survivors find difficult to talk about it.*

Nothing is more sickening than watching human lives get snuffed out. War is not swatting a passive fly on a wall. It is never as easy, neat or clean as portrayed in movies. While

showing depravity, what the media fails to show is that bravery lies in finding solutions to conflict. Killing contradicts the instinctive *where there is love there is life*. Even putting ones own life on line is like finding meaning for life through death. For such reasons some people find it exciting when lives are on the line. They invent reasons for wars - to pitch people against people by putting lives of some above those of others. Even their publicly stated reasons appear insignificant if cool heads were to prevail. This will happen more quickly if only the opposing leader were to meet face to face, even with guns in their hands.

Technology of warfare has evolved to overcome instincts that occasionally poke through indoctrination. A mechanized chain of command turns cowards into killing machines. Bombing is a game without eye-contact. Consider the indifference of a bomber who said: *I had no idea who was there, who they were targeting. But I knew it was important, so we went and did our job.* In this particular case in Afghanistan the mission was not accomplished although scores died as collateral damage.

Methods of modern warfare dehumanize all sides into such robots. For such purposes reality is portrayed as smudges on the computer screen. It is the virtual reality augmented by telescopic-sight of machine guns and myopic visions propped by pep talks. Humans deprived of independence of thought are inhumane and depraved. It is no surprise that soldiers are often drugged during the war and long thereafter.

Destruction and annihilation by markets. There are other ancient ways of dehumanizing people through mayhem and destruction. Methods of rape, loot, and inhumane treatment (water-boarding) remain the order of day. If this is not at the gun-point then it is under the conditions of starvation where people are forced into selling their possessions and bodies. Crusaders

and Colonial methods of loot and destruction of cultural icons are slowly transformed into collections in the European museums and a market in ancient artifacts. In fact, wide-spread looting in the aftermath of the fall of Iraq was justified by a US General as *the right of people*. That is also the purpose of free-markets. The gospel of the merchants is spread through all forms of media to create alien perceptions. It is all for the resource grab.

Conspiracy of silence. War is a cynical act for the economic exploitation. Numbness induced by wars is such that some times it seems better to forget. Others become participants by not confronting the lies. Control of resources drive out what does not serve the new masters. War prays on the self-destructive tendencies of the young who are struggling to find meaning in life and at the same time make ends meet. It creates a mind-set that fails to recognize dangers of pollution, smoking, alcohol, drugs and other self-destructive behaviors. People often want to drop out when things are not going well. War is just another way to do it - but made out to be more socially acceptable.

Patriotic drivel is often used as the justification for killing in war. Justification of wars comes in many shades. Real motives are rarely, if ever, acknowledged. Paddling myths is necessary to entice people into conflicts. It is facilitated by memorized aphorisms and buzzwords that inculcate a feeling of being victim. Pseudo-intellectuals and talking-heads mold the mission into beliefs. Warriors and victims alike treat shame and alienation with silence. Wary of bursting bubble many do not want to hear the truth of war.

I Ain't Gonna Study War No More. It is an essential character of war that they cause irreversible damage and often lead to irreversible actions. Wars are meant to numb thoughts and dull human instincts in order to counteract the basic pattern of human

behavior. In such an environment one wishes for the peace of just times. Is this the concern behind the chorus: *I ain't gonna study war no more, ain't gonna study war no more, ain't gona study war no more…*

Why do we study war? Virtually all history, at least the way it is taught, relies and credits wars as the turning points for people and nations. It may not be so but it is the common denominator of the perception introduced in the grade school. Is it a useful lesson plan for ways of solving problems and resolving conflicts?

Although it should, history does not entertain doubts. History is not about what happened. The way it is taught and often presented, history is a contrived account to continue to serve the victors. It is the wishful part of what some think we should know. It is for the empowerment of the few. It is a means of subjugation through perpetuated myths. It creates a uniform set of values and standards that can be more easily manipulated. It creates a perception of inevitability of the outcome under the conditions of cloud and fog. It closes mind away from more viable alternatives.

Imperialism. Possession of certitude is hallmark of imperialism. Imperial symbols may change, but the process is about a grip on the means that control existence. Consider their methods and means. Power of the ancient Egyptian (3000 to 1500 BCE) rulers derived from a cozy relationship between the state and those who divined with knowledge. Such priests rarely went out to subjugate others and all the men of Pharaoh were buried with the emperor. The Aryans went on to conquer land in India with *the divine powers vested by horse*. Alexander used similar methods backed with panache for propaganda to show his relationship to the divine. Even at the dawn of 21st century, when things were

not going well in Iraq, the invaders spin a tale of bravado from an accidentally upturned military vehicle.

Romans turned peasants into killers with short swords made from steel imported from South India via Assyria. This is the only way they could enjoy colonial wines and loot. As an aside, "*huri*" in Arabic also means raisin. Could it be that visions of everlasting heaven after jihad (holy-war) follow from a product of grape mixed with some sex? The Romans model of imperial government was adopted in 357 AD to shape Imperial Christianity. As a first step the church ordered that all the books that do not jibe with the new objectives should be destroyed. That holy-smoke still clouds visions of many a leaders and followers alike. What remained was sanitized into New Testament commonly known as The Bible. Rule of law and laws to rule have become synonymous instruments of conquest and subjugation.

Shaping perceptions in public domain. Human mind is impressionable. It is essential as a habit for survival. In seeking meaning mind is affected by words. Words of propaganda perpetuate lies and myths. Effectiveness of such means depends on the degree of indifference in the target population. Could this be the reason that we teach history to children? What is common to politics, wars, media coverage, advertising, propaganda, and education? They manufacture consent for aggression and exploitation.

Consider the way ancient Greeks are glamorized. In doing so one could take a reasoned approach. But to mold perceptions of children we take a far more sinister approach analogous to the approach Alexander took to solving the secret of Gordian knot in Phrygia. As the story goes, in a Persian village the yolk was tied to the cart through a knot that no body could untie for centuries. During his campaign to the East Alexander passed by. After

failing to untie the knot he cut the knot with his dagger that he kept with him for committing suicide if he fell on the hard times.

The event has become a model for the imperial mind. Many people have taken this approach as a sign of strength. People who cannot solve complex problem are celebrated because they *cut through complex situations*. Even educated-people learn to mimic such value-laden bits of information and anecdotes.

Wars are for control of minds. After destroying the alien and different, and subjugating the rest through mind-control, wars are about controlling perceptions of the *indifferent* or the so called silent majority. Here the end game is to control all the inputs to mind, or at least filter and shroud the inputs into cultural clouds and fog of secrecy.

One looses identity by loosing independence of mind. Control of resources follows. It ultimately threatens not just the way of life and sustainability but also the identity that comes from independence of mind. Who are the targets of the opportunists? You and me, and it matters little whether we are on the winning side or not.

Tools of mind control. What makes human most vulnerable is the perception of independence without the ability to sustain independence of thought, reason and action. One succumbs to concocted stories that cannot be affirmed or denied. Although both are lie-boxes supplanted with faith, myths embrace contradictions better than legends. For such audiences, the mass-media provides mindless sound bites of little value. The history books create myths and icons of what it may have been for the purpose of the victors. Through such means wars, state, and religions legitimize each other: *Praise the war and pass the ammunition*. It goal is to involve everybody in the guilt and the loot. Both do not sound as bad when everybody shares and the

blame is passed around as something beyond the individual control and responsibility. As the lesser means do not work, the indifferent are galvanized by war-cry. In such an environment resort to secrecy is as good as omniscience, and that too not in much different ways.

Media has a long experience of nurturing such a blend. Pseudo-intellectuals inundate the unsuspecting with make-believe and jargons of attitude-adjustment. Their limp articles with flaccid arguments ignore the issues by not even dwelling on the major themes. Teachers chime in to celebrate and sing the sanitized versions of what happened, or even present a 'revisionist' view. Sanitized stories for sanitized homes and minds give appearance of the real time participation.

Vicarious as it may be for the spectator, minute by minute concocted accounts do create a perception of virtual reality of being there. Rooting and sloganeering follows from such experiences. Often the participants made to feel that they are threatened. In such an environment, the propaganda and conflicting inputs make one believe that no-war is utopia. It may be so, but only for the mindless fools who do not want to face the prospect of the real outcome or go through the pain of rational problem-solving.

Open-media spice shelf. Just as it is difficult to see in fog and haze, it is also difficult to see in blinding light. So as to keep people guessing, if not to keep in darkness, the media blitzes rely on pretty much the same spices and herbs in varying combinations. Consider the impact of the invented issues popularized by the public relation campaigns to side-swipe corporate swindles, deception, hidden wars, invisible wars, use of depleted uranium bombs, spin-doctoring, manufactured consent, and claims of weapons of mass destruction perpetuated by words

of mass deception. By the same token the grass-root support is concocted to hide whatever else may be underneath.

Message-Boxes and pack-of-lies. Repeated words invent swift answers for shock and awe. Opinion makers use pack of repeated words to pretend objectivity to ignore and deny unpleasant facts of reality. Of course one can become hero by admitting mistake as omission even if it is so. Devices of damage-control provide people with something to talk about rather than to converse and inform about what happened. Like articulations of a mentally-challenged such talks go in circles. Watch a leader who has difficulty going beyond dribble of few memorized lines of buzz-words. They tend to drift into the same set of words. Instead of making a cogent argument, why do they repeat the same words no matter what the question is? Boxes of meaningless terms, if not the outright lies, are designed by the paid opinion-makers. They invoke negative evidence. Denials rely on implications that follow from images that draw from presumptions and biases. They exasperate people into submission to the authority-knows-best. Is it that simple?

Significant war footage aired by media is often pre-screened and authorized by the watch-dogs. Such devices project appearance of a consistent story. They rely on the short memory of people to deny culpability, credibility and accountability. Consider the claims of *weapons of mass-destruction* by one US president, or *I did not have sex with that woman* by another. There is no focus because there is nothing to focus on. The objective of staying in the box is to fixate, shift-down, or drown the discussion. Once the lie-box is hammered in, contradictions appear to be outside the box.

At least superficially one can not prove that bad media coverage, or for that matter belief in a non-existent omniscience,

causes damage to individuals. It gives livelihood to many who introduce credibility. There is no requirement that such opinion makers should not have such a blatant conflict of interest in grinding their ideological axe.

Recently in Vancouver I encountered a high-end art dealer. The statue in question belonged to a culture she knew little about. She tried to hide her ignorance in about a dozen different ways: first by sticking to the memorized words, then referring to the wrong period and culture, and then playing the blame game under the guise that the potential buyers are not well informed therefore it is not necessary to have correct information! The approach is not much different than a recent pronouncement from the US State Department: *They are a bunch of liars. We've dealt with ZZZ (it does not really matter – take your pick) enough to know bluster and lying with confidence are a part of the way they negotiate.*" He was doing the same to sell this message.

Fog of combat. Lies and spies perpetuate myths through propaganda to discredit and misinform. Urban legends are created for the political assaults on the moderate elements of the society. Control becomes the watchword in such an environment as most succumb through conspiracy of silence.

As is the case with most lies, in the end populations become victim of their own propaganda. It is far more dangerous than the friendly fire in combat. As words appeal to biases, most people become prisoners of words just as people fall in trap of judging others based on their appearances, clothes and title. People give up when faced with varying (conflicting if not contradictory) explanation. Self-reliance is replaced by the hope that may be somebody out there understands or at least knows what they are doing. In such environment it is often difficult to appreciate that not all ideas are created equal. Weighing evidence

and the contributing factors to sort out a complex situation requires patience to collect and deal with information.

Institutions to safeguard the society are the real casualties of war. Independence of the community is often at stake in war. It includes cultural context to all the internal controls which are intricately tied to the economic state. Wars are driven by economic considerations, and I am not certain if there were ever of any other kind.

In recent years many a cherished institutions and cultures have become victim of the flow of capital that is outside the controls of any reasonable aspirations of the targeted communities. It is often hand-waved as the collateral damage. In the end, the goal of any war or terrorist act is to destroy will of the people to change their own course. Two thousand years ago this was the reason given by the Romans for their punitive wars: to teach by burning and looting. Crusaders called it divine retribution. Colonials called it civilizing influence on the barbarians. The mindset to perpetuate such myths is not much different than that turned the British traders in India into ruthless autocratic rulers with imperialistic grand designs. Such deceptive practices and devious means still remain the norm for the modern variations of imperialism. The outcome of oil and natural resource concessions in the developing parts of the world is that the locals invariably loose all the local controls. As a result survivors of globalization sell their resources cheap in a contrived free market.

Wars do not necessarily select for the traits most desirable for survival of individuals or the community. Deliberate aggression by a group to control resources of the other invariably leads to mass dislocation or worse. Messianic interests with little scruples exploit, as swindlers with economic self-interest and

cunning come to dominate. An inevitable outcome of the wars in the twentieth century is evolution of over-consuming and unsustainable way of life for a few.

In the end one may wonder: With so much effort, labor, capital, resources and intellect invested in planning and execution of destruction from the just wars, why can we not find a way to a just and more sustainable existence? Have we gone mad? Are we not mad enough at what we see as carnage and mayhem wrought upon by the opportunists? Is there a message here for dealing with omniscience? Alas, solvable problems are not always solved. As wars destroy lives at great cost, medicine struggles to save lives at a fraction of the cost.

III-31. A Peace to End All Peace

Conflicts are inevitable. Wars are variations on the theme of imperialistic designs motivated to bypass equitable, just and rational solutions to conflicts. Genesis of wars, slaughters, and instabilities in the 20th century can be traced to the Balfour declaration in which *one nation solemnly promised to a second nation the country of a third.* To further their aims the allied governments continue to engage in massive propaganda to mobilize the public opinions for the flow of petroleum for an unsustainable way of life. While the countless innocents paid heavy price, the oil-economy has benefited some without having to deal with the dirty business of colonial rule. This experience shows that to disguise the real objectives, the politics of aggression is guised as democratic by catering to wide-ranging constituencies.

A short letter written on November 2, 1917 (reproduced below) has come to be known as Balfour declaration. It is addressed to Lord Rothschild an international financier. On the behalf of the British government it formally recognized the idea of Jewish homeland in Palestine. It clearly stated that *nothing shall be done which may prejudice the civil and religious rights of existing non-Jewish communities in Palestine, or the rights and political status enjoyed by Jews in any other country.* It is ironical that the British 'design' for the petroleum resources in Middle-East built on decaying Austro-Hungarian Empire was not very different than the Ottoman Empire the German alliance for the same purpose. The conflict is a root of the First World War in which 60 million people perished.

Foreign Office

November 2nd, 1917

Dear Lord Rothschild,

I have much pleasure in conveying to you, on behalf of His Majesty's Government, the following declaration of sympathy With Jewish Zionist aspirations which has been submitted to, and approved by, the Cabinet.

"His Majesty's Government view with favour the establishment in Palestine of a national home for the Jewish people, and will use their best endeavours to facilitate the achievement of this object, it being clearly understood that nothing shall be done which may prejudice the civil and religious rights of existing non-Jewish communities in Palestine, or the rights and political status enjoyed by Jews in any other country."

I should be grateful if you would bring this declaration to the knowledge of the Zionist Federation.

Yours sincerely,

Arthur James Balfour

This letter from Balfour is not merely a part of a war time strategy. It was to shape a post-colonial new world-order. It has spawned scores of conflicts since then. It is a political and economic policy document for the divide and rule in Middle-east, India, and other colonies. It is masterfully does not delivers what it says. Standard History texts talk little about its context. This document has been widely used for the propaganda purposes as evidenced by the several thousand hits on a Google search.

The factual basis for my article draws heavily but not exclusively from the work of Robert John:

(a) The Journal for Historical Review (http://www.ihr.org): Volume 6 (4) 389 (1985-6). Behind the Balfour Declaration: Britain's Great War Pledge To Lord Rothschild.
(b) Behind the Balfour Declaration: The Hidden Origins of Today's Mideast Crisis, The Institute for Historical Review, 1822l/2 Newport Blvd., Suite 183 Costa Mesa, California 92627 (1988).

Balfour Declaration. This declaration evolved out of the Colonial practices where designs of the military might were coded into agreements and declarations. Such Eurocentric transactions during the last 500 years have annihilated millions and uprooted billions of people as the territorial claims, including the people living in such territories, were sold and bought for few pennies for a square mile. The same end-result of *chilling and killing* in the twentieth century is achieved by carving out puppet-states in the guise of democracy, human right, and worse.

Some of the considerations and the forces that could have shaped the basic premise of the letter by Balfour are outlined below. It is probably interesting, but largely irrelevant, to consider how the factors outlined below weighted in the actual decision. Yet the fact remains that all the eleven factors prevailed during the decade when the letter was written. More important is the fact, although not explicitly acknowledged, that such factors still continue to shape the perceptions of the decision makers as well as the opinion makers. The main thrust of my article is to list the geopolitical and economic circumstances surrounding the Balfour declaration. Understanding of the origins and the consequences of the declaration provide insights into several interesting aspects of the policies laid down by the British imperialism and its geopolitical consequences.

1. British duplicity and rise of the Western axis of deception. Reasons for the World-War I range from finding ways to consolidate decaying Empire on which sun was beginning set to monopolize business potential of Middle Eastern petroleum and its transportation to Europe. The far-flung empire was already engaged in unilateral games of international colonialism. The public law announcement by Balfour on behalf of the British Cabinet is legally invalid because British did not have sovereign right over Palestine. The mockery of the situation in the words of Arthur Koestler is: "*One nation solemnly promised to a second nation the country of a third.*" More than that, the country was still part of the Empire of a fourth, namely Turkey for the preceding 400 years. In 1917 the region was under the Ottoman rule.

Later the statement of the "British intention in secret deal with French" was accorded the status of a multilateral "mandate." At the League of Nations it had assent of United States with its own imperialist designs to pick the economic pieces (markets) of the disintegrating empires. The cold war provided a new thrust for the evolution of this axis of deception. In the same decade the British made overlapping commitments to the Arabs as a way of getting them to support the war against the Turks. When the Turks were defeated, Britain went back on its word to the Arabs and divided the region up between itself and France. They finally pulled out in 1948, leaving many Arabs state and a nascent Jewish to fight it out while making the region unsuitable for economic development. French did the same in their ex-colonies and in 1961-1963 murdered almost 90% well educated citizens before leaving Algeria. It continues in other ways which prevent the natives to build on their enormous riches and resources.

2. Control of the energy resources. With the development of engines for a variety of purposes it was clear that the energy

supply had geopolitical consequences. The world was becoming increasingly aware of the potential of the energy resources. Recognition of the importance of petroleum as a unique energy resource was the beginning of balancing the geopolitical influences for the long term economic decisions and planning. By 1916 it was clearly evident that the disruption of supplies could be a major set-back to economic stability.

Unknown to the people of the region, the British were aware of the great abundance of oil in the Middle East. In May 1908 petroleum is discovered in Persia (Iran). British adventurer William Knox D'Arcy strikes oil in 1908, seven years after obtaining drilling rights to the land from the Persian government. In 1909, D'Arcy joins with Burmah Oil to form the Anglo-Persian Oil Company in 1909. The unique qualities and commercial potential of cheap "black gold" as a finite resource for the energy needs were widely recognized. For example around 1911 the British Navy had switched from coal to oil. It was important for the British Empire to reconfigure its policies in the light of its dependence on oil.

By 1917, the British government, which owns 51 percent of the company, is the most influential power in Persia. Britain uses the company's reserves during the 1914-18 War. In this decade several American robber-barons were also taking their hold on the oil wells and the supply chains. The robber-baron model, *a la* the Standard Oil, for the economic control of resources was also an enticement for the European royalty that was loosing grip on power. The newly formed oil companies provided the royalty with an opportunity to retain and invest their wealth. Since 1912 the model, seeded as uprisings through spies like "Lawrence of Arabia," has "invented" the figureheads like King of Iraq, Saudis of Arabia, and Shah of Iran. The descendants of these companies

remain in collusion with the certain Governments and as the king-makers in the other countries. Institutions to express political aspirations and economic potential of people had no realistic chance in such environments.

3. Connection to the other parts of the Empire. The historical context for the letter in 1917 has several interesting aspect for the British. Before the end of the 1914-1918 War British hopes were buoyed by their invasion of the Middle East. General Edmund Allenby decided that the "declaration" should not then be published in Palestine where his forces were still south of the Gaza-Beersheba line. This was not done until after the establishment of the Civil Administration in 1920. Moreover during the War and soon after the British also promised to the Pan-Arabic intellectuals, for their support against the Ottoman Empire, that the territory would become a Pan-Arabic state. Needless to say these secular groups were short-changed.

The policy of Divide-and-Rule is apparent in the political geography left by the colonial lords as they withdrew after WW2. The cold-war policies promoted systematic destruction of all Nationalistic aspirations virtually throughout the Asia, Africa and South America. Note that none of the ex-colonies, with the exception of India thanks to the likes of Gandhi and Nehru, emerged as viable democracy. Instead, driven by the anti-communist phobia of the Europeans and Americans, dictators and despots were installed in the guise of progress, modernization, Human rights, free market, and democracy.

4. The Road to India. Before the commercial aviation the British government had a great desire to maintain an open channel through the Middle East to its extensive possessions in India and East Africa. Members of the British ruling class thought that their control of India was eternal as the Jewel of the Crown Both Egypt

and Palestine were on the road to India. Possession of major parts of the Middle East was necessary to maintain their hold on the subcontinent. Introducing a Jewish State into Palestine was part of the British "divide-and-rule" policy. It could also help them in maintaining a permanent presence near the Suez Canal.

5. The timing. The declaration in 1917 coincided with the rise of the Bolsheviks in Russia and the potential for the fall of the Ottoman Empire in the Middle East. The British government wanted to keep the Russians in the war and persuade the Americans to enter the war. This London-Washington axis continues to target for fall and instability the secular and nationalistic governments in Middle East and other resource rich regions of the globe: Chile, Vietnam, Ghana and others.

6. An appeal to the economic power of the European Jews. The fact that the letter is addressed to the Zionist Federation through an international financier and a major shareholder of the petroleum interests speaks for itself.

7. The Jewish-problem. For virtually all considerations 1916 was a disastrous year for the war efforts of Allies. The goodwill of Jewry was paramount to British because money and credit were needed for the war. For decades Herzl had propounded the idea of "Jewish homeland" which spawned movements in Europe, Russia and America to solve the problem of European prejudice against the Jews there (the so called Jewish-problem). These movements had recognized the need of working with one of the major powers and *be fully prepared to take advantage of any occasion that offers itself*. A British decision to favor the Zionist cause would encourage both Russian and American Jews to influence their governments to join with Britain and the Allies in the fight against the Germans and Turks.

8. **Messianic connection**. A secular historian concludes: *Biblical prophecy was the first and most enduring of the many motives that led Britons to want to restore the Jews to Zion* (David Fromkin, *A Peace to End All Peace*, p. 298). According to these believers t*he day will come when the words of the prophets will become true, and Israel will return to its own land.* The major members of the British cabinet were motivated by such Christian beliefs. Lloyd George, the British Prime Minister, was a puritan who was brought up on Bible and was not educated in more modern tradition. In support of the Jewish homeland he declared: *It was undoubtedly inspired by natural sympathy, admiration and also by the fact that, as you must remember, we had been trained even more in Hebrew history than in the history of our own country. I could tell you all the kings of Israel. But I doubt whether I could have named half a dozen of the kings of England!*

Interestingly, the later day politicians like Jimmy Carter, Tony Blair and George Bush are also "inspired" by the Scriptures and Messianic beliefs. Protestant fundamentalism supported by means of mass destruction is one of the worst threats at the dawn of new millennium. Such thoughts, words, and practices of mass deception are invariably used for molding public opinions at crucial junctions. Recall that Holy Wars by the crusaders were initiated in 11th century through lies invented by a French Pope. Believers continue to invent plights of white man's burden, manifest destiny, and human rights to assemble allies to target the resources of weak and the unsuspecting.

9. Raw material for explosives. Early in the war, the British were desperately short of timber, from which acetone is distilled. Acetone is the key ingredient for the manufacture of explosives. At the recommendation of the Zionist friends Dr. Chaim Weizman, a Russian immigrant to Britain, was given responsibility for solving this problem. Weizman developed in

1915 a method to obtain natural acetone by fermentation of horse chestnuts. It was used to make ammunition. However, Weizman never mentioned it in his autobiography *Trial and Error*. He was to become a Zionist leader and the first president of Israel.

10. Coincidences of association. Invocations of God and such ideas and words are cues to garner support from certain interest groups. The wartime British Prime Minister Lloyd George was also a staunch supporter of the colonial policies. For many years he had served as the lawyer for the World Zionist Congress and also the lawyer for the Shell Oil Company headed by Marcus Samuel. Lloyd George's rise found sympathetic ear and a close political ally for the Zionist aspirations.

11. Cultural cloud of racism. As a British advisor to the region in 1920s put it *locals weren't capable of running their own show.* Local self-governments under colonial mandate could not carry out any policy against the advisors with imperial designs. Many of these are now backed up with secret international agreements. Even to this day institutionalized biases built into religion, race and tribe are used as a matter of policy to tilt perceptions (propaganda), seed political dissent and social instabilities to foment revolts.

Such methods are hall-mark of the colonial mind. Crotched in scientific theories blessed by the church such practices had propelled the Industrial revolution. Empowerment that followed from it was used to justify warped theories of social and political change imposed on the unsuspecting and weak. Such practices were institutionalized with full participation of the Church for the benefit of few in the Edwardian England. Consider the fact that just before the 1914-18 War, more than 40% of the Britons did not earn enough to provide for food. One in three young men who applied for war jobs did not meet minimum standards of health. Also one in two who were lucky enough to become soldier died

within a year. With over 20% unemployment, most jobs did not have time off from work, or medical care or pension. With such conditions at home, British elsewhere looked down on their brown, black and yellow subjects as inferior and not capable of self-rule. It is not unlikely that they thought little of uprooting few barefoot, camel-herding Arabs running about in what they believed was an almost empty Palestine. This has propagated the Zionist myth of *land without people for people without land*.

Does the evolutionary fitness lie in sneaky and devious behaviors?

Have you ever wondered why humans as a group display sublime as well as reptilian behaviors? It is not that those who are fit survive in the long haul, but those who survive are fit for some reason. Consider the zeal with which the strongest dung-beetle guards its property. It keeps its harem under the dung-pile. While the strong male guards on the surface, weaker males gain access to the harem through tunnels. Think twice before you conclude that attributes of sneaky and devious behaviors are seen only in the animal kingdom: Princess Diana of England had relationships with her horse trainer and others.

Unhappily ever after. Consider the consequences of a long line of half-backed notions such as: Humans are naturally cast into races, survival of the fittest (George Spencer and Darwin), Laissez-faire human interactions (Adam Smith), natural antagonism between capital and labor (Karl Marx). Are they part of sneaky and devious behaviors? As strategies, such behaviors have to be couched in more grandiose terms because they will be ineffective if everybody relied on them.

As a way to rationalize human aggression in the guise of individualism, the strategy is part of imperialism, industrial conquest, and monopolistic markets. Their futility became apparent with the war of 1914-18 and ensuing collapse of the Victorian values and the Czarist and Austro-Hungarian-Turkish empires. Against this backdrop the Balfour declaration provided a basis for implementing the devious divide-and-rule policies in a new garb of the Zionistic humanism and Evangelism. It furthered the cause of royalties, robber-barons, and now the DC beltway bandits in the guises of international corporations. Such operations continue to be conduit for the smart money that defies the democratic controls within national boundaries. They extended the Colonial control into unholy alliance of finance and business interests that seem to change every few decades. With little regard for national boundaries and controls, the smart-money relies on undemocratic means. Concentrated power and business values in markets promote unsustainable behaviors of over-consumption, and encourage conformity that threatens perceptive consumer.

Unholy alliances of economic reality. A profound policy outcome of Balfour declaration has been the push to set up tribal and theocratic states in many parts of the world by pitching one group against the other. The 1920 Treaty of Sevres, settling borders after the 1914-1918 War, carved Kurdish and Armenian states partly in what is now Turkey. Its outcome continues to create instability in the region. Similarly, the mess created during 1930 to 1950 in Europe was a direct consequence of the terms of settlement of the 1914-1918 War. Such moves essentially ignore the needs of people. Even to this day the people who have been adversely affected remain suspicious of the perfidious intents of the Western powers. Many of these "dissidents" continue to be

nurtured by the intelligence agencies to be "used" at opportune moments.

Recent history of the Middle East is a mix of alliances to share the loot by disenfranchising the aspirations of the local populations. In the years since 1920 the region has been dominated by forces designed to secure a stable supply of oil for an unsustainable way of life enjoyed by less than 10% of the human population. The collusion between a stooge (Faisal) and Lawrence of Arabia was initially glorified and then secured through massive military investment and treaties. Stability of the supply chain also secured personal enrichment of tribal chiefs. At the same time the countries are burdened with international debt and most of the population remains dispossessed.

There are several disturbing social consequences of this policy model. Concentration of capital in few hands has undermined all rational aspirations of the common people throughout the Middle East as well as large parts of Africa the Latin America. These are resource rich regions. Yet any new government in these regions will have empty treasury and remain debt-burdened for the foreseeable future. It is not surprising that without any significant exception the region from Pakistan to Nigeria is dotted with impoverished countries that are propped up with aid-packages (additional yearly debts) of 1 to 3 billion dollars. Typically, two thirds goes for Military hardware for "peace keeping" which is euphemism for suppression of the local populations through police state. The rest goes for payment of interest on the old loans to give appearance of solvency for the bankrupt governments.

The national boundaries in the Middle East were drawn arbitrarily, if not deliberately, to keep the feuds simmering. The economic interests of the colonial powers dominate at the expense

of the cultural cohesiveness and viability. Conflicts are easily implanted in an environment of diverse cultural backgrounds. Some of the dissenting minorities are courted and trained in subversion. The story is the same as diamonds wreak havoc in Southern Africa, tin and rubber did that to the South East Asia, copper to Chile and bananas to Guatemala. Hallmark of such 'operations' for nefarious ends are forked-tongue, dagger, smoke-and-mirrors.

Is it all behind us? Certainly no. As one empire dies it becomes "poodle" of another with imperial aspirations. Unipolarity is the hall-mark of imperialism (publicintegrity.org). Although Winston Churchill was the last avowed imperialist, British for example used the strategy of 1917 in 1970s to "declare" Diego Garcia as an "uninhabited Island." The food supply for several thousand of its natives was shut off first. Then with a day's notice, all the inhabitants (about 6000) were herded into a ship and dropped off in the slums of Mauritius. A case was brought to a British court against British Government after the "secret" documents were made public in 2002. It was decided against the Government. However, the judge did not institute any remedy. Meanwhile, these displaced people are not even allowed to visit graves of their ancestors by the new landlord.

British had sold the "uninhabited" Island to get a 40% discount on the purchase price of the Polaris missiles. It saved them about 5 million dollars. These wielders of mass deception (WMD) invented the excuse of the weapons of mass destruction to justify their attack on Iraq from the forces based in Diego Garcia in the Indian Ocean. The attack was planned years before the honorable mission of was launched with fog of mass deception.

So what is the relationship between actions of the alliances and consequences for the nations? Changes occur as dictators

replace fiefdoms Puppets possessed of certitude rule at the mercy of the external aid. As the capital leaves the boundaries, little wealth is created for the nations whose resources are depleted. Debt-burdened nations have little capital for nation building. In many of these places those who are concerned have fallen in the traps of mindless assumptions about what is good for most. Often it is what is in the interest of a few. Such developments reduce chances of bringing back any reasonable government.

Panacea of Industrialization. Recall the vision of Margaret Bourke White (ca. 1947): *A machine cares nothing about a man's ancestors. It does not feel polluted by his touch, knows no prejudice*. For a significant fraction of the human the industrial revolution has changed the man's view of himself. Has industrialization taken care of social ills that affect more than half of the world population? Definitely no. Insidious forces from the far and away and acting behind the scenes replace some local ills. Such liberations have shut off many too many for too few and for too long from any meaningful pursuits while means of exploitation reach their village boundaries,

It is economics, stupid. Globalization is not about global citizenship. Just as socialism is not an economic policy, capitalism is not a social policy. Democracy is neither. An ideal can equally well support the wide ranging social alternatives. Calls for human rights, Globalization, Free markets are rather vague dead-end ideological buzz words. There is disconnect between what is connoted and what is delivered. Like omniscience, they have to be backed up with force and wars to further the imperialist grand designs of few. Such institutions do not offer, and they often bypass, fair and equitable solutions to conflicts and aspirations.

Controls offered by pluralistic societies, diverse economies, and multipolar geopolitics have become largely irrelevant in the context of unipolar interests and whims. Sustained war requires building myths to harvest sympathies of diverse populations. Internal democratic controls are often bypassed through blatant propaganda that appeals to and finds support among the populations with otherwise meaningless lives. The process is facilitated if the war is prosecuted with the support of dictators and despots. Imperialistic powers can rarely self-sustain. Therefore, antidote to encroachment is stalemate. More insidious encroachments will have to be confronted through massive non-cooperation with the economic engines and propaganda machines. Otherwise *an eye for eye leaves everybody blind.*

In the guise of imperialism and globalization, the unholy trinity of colonialism, racism and violence undermines sanctity (sustainability, justice) of common man. On the other hand, as Gandhi noted *we can not be dominated unless we cooperate with our dominators*. As a means of change, targets of non-cooperation are to be carefully chosen. Individual and collective assault is needed though the orthogonality of labor and capital that feeds on the polarity of poverty and wealth.

In our emulation of qualities people worship the rising Sun. Consider the hall makes of the American model of open market and globalization:

- It benefits some (oligarchs and other pockets of wealth) with no interest or loyalty to the societies that contributed to their success. The smart-money moves across the borders with impunity without any regard for the sustainability with diversity and plurality that created and preserved the local resources (food, culture, language and ingenuity). The cost of disconnect is a loss of niches and diversity that encourage pockets of creativity.

- It encourages culture of homogenization indifferent to craft and creativity.
- It sacrifices subtleties of happiness for the (stingy or generous) materialism.
- It develops depression without ability to deal with the vicissitudes of life.
- Its objective is to be less accurate and discriminating.
- It is politically progressive but individual is marginalized.
- It describes and exploits knee-jerk reactions to advance propaganda that is less accepting of the states of subtlety, ambiguity, and imaginations.
- It justifies pragmatism as the reason to support dictators, despots, social polarization, and class warfare.
- It blurs the boundary between public and private for the legal, economic and power gains with little concern and discrimination for pluralistic emphathy and judgments.
- It is concerned with where you want to be rather than where you have been and where you are.
- It privatizes the profit and socializes the risk.

In effect, the mentality of seize imposed by the alien forces of globalization are justified as occupation for the "greater good of the occupied." We have seen many variations on this theme over the last few millennia.

Finally, it is the beginning of the end when virtually all the resources are consigned to maintaining a status quo (grab). Readers may be wondering why should we worry about the forces of war and for that matter about what disrupts the dynamics of peace? At the very least it is an exercise in consequence evaluation of complex situations from which we cannot run away. For another such forces come in all guises of know-all. Besides the survival issues, such forces impinge with

the development of what we know and represent in usable motifs. As ridiculous as many of the arguments used to justify such encroachments are, in an environment of haze they begin to influence our perceptions as well as the common sense.

Chua, Amy (2003). *World on Fire: How Exporting Free Market Democracy Breeds Ethnic Hatred and Global Instability.* Doubleday, New York. Pp. 340.
http://www.consumers-against-war.de/

III-32. Knowledge: Been There

Many things are out there, but we are not looking for them in the right way. We are not following the right track. We're following what may be important tracks, but we miss many possibilities. Ideas come up from time to time. But what makes them really significant is seeing what is important and demonstrating them in a way that is convincing.

At least in the short term, the details of the social reactions to the presentation of a new thought decide who wins and who looses. Some of the disagreements will be resolved by a combination of all the usual things that scholars do: patient argument, character assassination, amassing of facts, intimidation, careful review of reasoning, mischaracterization of opponents' views, scrupulous analysis, and ridicule.

- Mixed-and-Matched quotes from E. B. Hook, 2002.

Knowledge is cognized experience. It is a way to judge reality. It is the dynamics of transition from being there to being over taken by common sense. It is the uncommon sense of doing something about it.

Resonance and dissonance are part of the dynamics that takes particulars of the prior and current experience (body of knowledge, facts, experiments, observation, data, information) on a path (direction, trend) to an understanding of the mechanisms and implications to identify useful generalizations. It is integral part of all reasoning. Obviously, individual insights do play a critical role by pointing the way as the individual efforts garner additional evidence through practice.

Dynamics of point-and-counterpoint is an integral part of individual cognition, its validation by the peers, and acceptance by the community at large for practice. The canonical knowledge may at times appear to be created by the powers-to-be (courts, experts, divine) they only put their seal of approval (affirmation) at the critical junctures. For example, at the end of the twentieth century the Catholic authorities of Rome accepted the idea that the spherical Earth orbits around the Sun. I guess it was for the benefit of the Church itself. Along the similar lines in 2003 US Supreme Court ruled that what two consenting adults do in their bed-room is not a concern of the State. Clearly, concern and caution are the watch-words for the validation. It affirms the peers with their own seal of approval.

Chaos of shared knowledge

How do people deal with what is not on their radar screen? Often the producers and consumers of knowledge feel frustrated. The path of establishing knowledge is not a systematic linear process. It is a multi-dimensional search through hierarchical relations to be developed with a variety of criteria. Purpose of identifiable and convincing breakthroughs is to develop viable new connections of the past to the present. Opposition comes as new ideas run into conflict with existing dogma, taboo, and theories. In such new encounters stages of ridicule, opposition, and self-evident truths.

Dissonances deal with the doubt and the non-paradigmatic. Practices and concept include: Death, wars, inquisition, scorn, derision, rejection, ignore, skepticism, smart-alec's, overlooked, ignored, innuendos. Such reactions are analogous to the disdain of doctors for their patients who outlived their prognosis. Excuses can be flimsy as in the comment of one

Professor Cremorini against peering through the telescope of Galileo: *.. and besides, looking through those spectacles gives me headache.* Einstein is said to have greeted quantum mechanics with the comment *God does not play dice.*

Resonance change attitudes. Reward may be just knowing that you survived or prevailed, or more worldly and heavenly rewards. Resonance lies in seeing ideas in action (raising questions, identify issues, acknowledging gaps, predicting what and where to look for). Compelling evidence precedes grudging acceptance of the *apparently impossible* as the *expected* or *obvious*. At some point or other the apparently impossible have included flying machines, continental drift, quantum mechanics, laser and maser, and the internet revolution. Along the same vein, peaceful means for conflict resolution and coexistence are gaining acceptance as the futility of the violent means is realized.

Vindication cones when enemies vanquish. An interesting outcome is in the comment of Lord Rutherford: *Science is Physics. And all else is stamp collecting*. Few years later for his work he was award the Nobel Prize for Chemistry.

Practice of science is chaotic. Natural sciences are operationally the shared knowledge base. Quasi-, pseudo- and omni-sciences have cult follower not unlike the just in case believers or the lottery players. Science is about the validity of method, object, concern, and the outcome. It does not even pretend to be profound although its findings have had profound consequences. Even without a clue of the possible reasons useful methods and reasoning is built for the search of the probable. The approach is hijacked if we search for reason without any clue from the particulars of reality.

With an emphasis on the proven theories and without an explicit appreciation of the real, what is taught in schools amounts to quasi-science. Contrast this to omni-science that relies only on the universals, where cart placed before the horse goes nowhere. Pseudo-sciences rely on ad hoc theories to account for everything without ascertaining their veracity (UFO, extrasensory perception). The end result of all such searches is outcomes with little continuity of thought.

We are often told that *this is what it is*, *that is what is meant to be*, and *that is all there is*. Such blinders relegate the alternatives to the "impossible." The position is justified with flimsy excuses. Ignorance appeals for the tradition or biases couched in the aesthetics.

Ponzi-schemes violate reality.

Wars are Ponzi-schemes. Schemes from the Wild West sell dreams. Consider the cost of such nonproductive enterprise where no value is created, yet the resources change hands. The skill lies in the ways one hides violation of the conservation principle in a zero-sum game. In spite of remarkable advances in literacy it is still difficult for most people to recognize that not all ideas are viable, nor can they be converted to the products of value. Very few of these turn out to be panacea touted by consumer economy.

Mechanisms to correct the course of shared knowledge lie in its demonstrated utility. Invariably it is not evident to the observers at the fringes. Such groups can hardly distinguish the reality of an airplane from the mere ideas of UFO, perpetual motion machine, and automobiles that run on water (Eisen, 1999). Principles, ideologies and dogma based on the mere wishes and not-open to the scrutiny can only drive the carts of pseudo-, quasi- and omni-sciences into ditches and dead-ends. From such perspective it is difficult to distinguish or grasp the significance of

what is not here and now. Common sense of here and now has survival value for the recognition of niches. It takes uncommon sense to realize its potential.

Even premature science does not include anything that violates or contradict the basic laws of conservation of matter, i.e. something (mass, energy, information) cannot be created from nothing. That rules out perpetual motion machine and omniscience. It takes an uncommon sense to grasp many other variations that contradict reality. For example, a real entity cannot exist at two places at the same time. As it stands now almost everything that stands beyond such limits imposed by reality can be considered possible. It also requires an uncommon sense to appreciate what lies in the realm of feasible. I guess that rules out the possibility of a union between science and religion as some are envisioning. I am not sure why religion needs science for its validation, unless there is some doubt and discord in its own ranks.

Knowledge is about the uncommon sense of managed expectations. Knowledge is democratic, and science is more so because it relies on trial and error through practice. It is not because each person is equally empowered but because the validation process gives a chance to all relevant arguments of particulars and universals. Such mechanisms sooner or later weed out the wrong and inconsistent. The contradictory rarely see the light of the day.

As unfair as it is for the individuals, in the end the cost of such dissonances for the premature is worth paying. In the credo of science there is an explicit appreciation of such validation process. It is all the more of a necessity if as the search is driven by the credit and profit motives. Dissonances also follow from

unreasonable expectations of the consumers of science and technology. Common sense may focus on thoughts, words, and potential of ideas, however uncommon sense is required to realize which of these are not counter to modes of reality. In retaining focus on reality, shared knowledge manages expectations through practice and consequence evaluation.

Need for knowing and validation

Acceptance is critical appreciation. Resonance and dissonances become apparent as we begin to see, notice and appreciate the significance of events and insights. As we examine implications, dissonance and resonance come into play in the concept space of disbelief, disagreement, skepticism, humiliation, derision, silence, and the various brands of trusts. Faith and belief discourage such open scrutiny. One learns from practice *where an instance of open-minded honesty and compassion is more important for the critical appreciation than an hour of logical argumentation* (Michael Soule). Of course, acceptance beyond the disciplinary and cultural boundaries takes demonstrated relevance to the local concerns and contexts.

Not only the actions alter the cause but the individual perceptions also change subject-object relations to evaluate advantages and weaknesses. From this vantage point, perceptions are everything in wars, marketing, arguments and discussions, setting priorities and making decisions. Sensory inputs are meaningful only with interpretation guided by a mix of inputs of mind that include prior experiences, wishes and desires. Sooner or later one recognizes that the outcome can be faulty and unreliable for a variety of reasons. Searches through perceived reality are not about establishing knowledge, but about finding a correspondence with the verified knowledge.

Knowledge is as much about the content as the ways of knowing. Successful outcome requires a healthy respect for the tension of feedback that comes from *show me how do you know before I make my mind*. This is how practice validates experiences while entertaining doubt and alternatives. Beliefs increase the threshold for the alternatives. The value of doubt is in finding relevant beliefs, and then in figuring out their relevance by minimizing uncertainties, removing identifiable doubt, and then addressing skeptical concerns that may be valid.

Science as a social contract. Knowledge builds on the idea that not all thoughts, and certainly not all word constructs, are created equal. There may be many ways to get there, but efficient search towards desired goal relies on the *monism* of the underlying reality. For such reasons all products of knowledge are intricately associated with the measurement problem in terms of defined and verifiable parts. Rigor of measurement facilitates communication. Demonstrable differences are for example part of organization and categorization, and also setting up suitable specifications and controls for analysis. Consensus emerges as the individual measures are correlated and modeled with suitable criteria for verification.

The ultimate utility of knowledge lies in its predictive power. As an end-run, as if to capture a broader basis for the phenomenological diversity (prior art), all searches give way to viable hypotheses of relations. Nothing succeeds like the accepted success as utility. Faraday observed: *As an experimentalist I feel bound to let experiment guide me into any train of thought which it may justify… believing also that it is in its nature far more suggestive of new trains of thought*.

Whether for insights or usable technologies, the knowledge enterprise would not exist without social acceptance of its products. The Social Commons provides the resources, support, and the testing ground. It looks forward to a vision of what it could be, and not just what it was or even what it is. Such multidimensional interactions go well beyond solving problems at hand. The vision of life recognizes that potential of sustainable existence is possible only through a web of interdependent thoughts.

Images of the potential are rooted in perceptions. Ansel Adams saw *photographs as analytical interpretation of things as they are.* It has resonance with the analytical school of thought that had its hay-days in the 1920s. To most viewers images are for contemplation. Consider the photographs of babies. Without being there, images provide significance, immediacy, and objective relationships for developing subjective perceptions of what it could be.

Interactions with images, motifs and metaphors, provoke opinions and rationalizations. The feedback searches for credibility and veracity. In this search, it does not matter whether or not the images are balanced as long as they offer a tangible representation. Once the imagination takes over, the door opens for wide ranging interactions of varying extents and intensities. Individual threshold sets the course for insights into shared reality that can deal with conflicts and desires. Even without a total grasp of the content, our interpretations of motifs and metaphors assume a conceptual continuity of the content. Is it intuitive? Possibly yes, at least relative to a subjective and empirical frame of reference.

Need to look at the parts. A boundless whole is indistinguishable from *nothing*. Just as we can more readily recognize a change, representations also build on significant parts. Such discreteness facilitates analysis and contemplation, and provides usable modules. For the summation of the sensory inputs we also move though organization, classification, and taxonomy of parts. Depending on the means at their disposal the process of to-and-from parts is used by thinkers, savants, inventors, discoverers, explorers, navigators, inventors, marketers, regulators, merchants, and discerning consumers. We also look into parts with the assumption that identifiable doubt may be due to a defective part. We all benefit from tools of trade.

Analytical methods. The modern analytical methods to aid the sensory inputs (telescope, microscope) developed only in the last few hundred years. Yet ascent of man relies on the understanding of the behaviors of parts and modules. Such an understanding can be integrated into discernible more complex modules of hierarchy as brick-walls, machines, and computers. Analysis comes into play with the realization that objects and behaviors follow from a defined order and hierarchy of the component parts. Such a realization has set in motion a race for one-dimensional reductionism. It becomes dangerous if the dimension of reality, as for the human behaviors, is operationally reduced to only aggression, or only economic behaviors, or only to survival instincts. Rarely do parts add up to a functional whole.

Measures of the world. Having opinions based on impressions is not naïve. In the market place of ideas and thoughts reality follows from practice. Believing that you can convince others is another matter. Such actions depend on reliable measures of reliability. It is real if you can discern it, measure it, take count of

it. We begin to take a measure as we represent an object. We grasp it as we describe it. We are curious as we explore to remove chaff of wishful. This way we contemplate the objective and subjective. As a measure of transition from the subjective to objective reality, consider how much time elapsed since humans were first intrigued by birds-in-flight until the birth of modern aviation. By such criteria omniscience or God is neither a subjective nor an objective representation. One would reach the same conclusion if one tried to represent nothing.

Liabilities are part of usable knowledge. Knowledge is not just finding or being given. Nor is it a matter of accepting something with convictions of mindless blinders. What is handed down is often as good as the people who handed it down. What is handed down is often a means of control and empowerment. It is a promise with attached strings. Such motifs are not viable.

Acquired wisdom is neither acquired nor wisdom. In order to adopt what one gets for ones own purposes it is necessary to look into not only the content, but to explore the premise of methods, criteria, liabilities in the handed-down knowledge. Often it helps if we understand the motives and purpose of all those involved in the transfer.

Individual search provides meaning to life. There is tendency to remain faithful to what one understands. It is a matter of mind to find and invent meaning through multidimensional searches. Valid searches are made with the realization that it does not encompass the whole. Yet, the wisdom lies in picking parts that are relevant for actions and the moment. So-called horizontal searches organize and categorize inputs and inferences for

descriptions of complexity and regularity. Traditional approaches of natural history and philosophy are of this kind.

Orthogonal to the analytical focus on parts is the desire to reconstruct and experience the whole. As a way to explore, analytical deconstructions provide tangible pieces to reconstruct alternate worlds. Such searches provide bases for identifying viable connections. Reconstruction helps in identifying nodes that are not necessarily linear measures of the reality intrinsic in the parts. Reconstructions tempt us to envision, if not grasp, that proverbial universal. Here again wisdom lies in relating parts to the hierarchy while realizing the limitations.

Clearly, outcomes orthogonal methods of searches are complementary, and certainly not mutually exclusive. The process moves through trials and errors with no guarantees.

Dimensions of time in search of reality. Past is justified if it has utility for the future. For such purposes knowledge is not accumulated information. To chart the future, for example we need broad frames in which to generate validation criteria by inviting comparisons and identifying the trends. Putting it together calls for avoiding situations where *all parties talk, but not talk to each other*. All individual searches through valid representations stay in touch with reality. Yet the various outcomes can not necessarily be treated as transitions, or relativistic, or proven absolutes. Clearly, such intellectual honesty is critical for testing and ascertaining veracity.

Veracity of knowledge. Impressions and personal knowledge are passive acts. Only active searches provide meaning if behaviors follow in the context of social, cultural, historical and geographical experiences. Consider the role of ignorance, aggression, want, and survival instincts in shaping ideas about tolerance, plurality,

social contract, wars, technology and sustainability. Certain common threads from the human history are:

- There is always a lag between conception and implementation.
- Relations evolve and are then adopted slowly.
- Layers of knowledge grow invariably as overlapping changes.
- Such processes are open-ended.
- Changes resolve innate human concerns.
- Successful solutions (technologies) do not stay the same.
- Significant changes are essentially unidirectional.

How do we know? Search matrices are useful to evaluate outcomes on the basis of the criteria applied to observable categories. Through analyses we try to peel the rest from a constant of the intrinsic quality. Through more elegant models, motifs, and metaphors we aspire to peer into the potential. Devices of shared disciplinary matrix and theory make data appear intelligible. Particulars are the matters of fact and world-readings that we wish to engage in building the relations. Relationship between inputs, methods, tools and outcome has to be sufficiently clear to assign a causal relationship.

Individual perceptions are about transferring the information from probabilistic to the deterministic domain. Individual perceptions influence the world-readings of the facts, their interpretations, and usability. Therefore, validation is a shared process. It is a trial and error approach that requires plurality of inputs. Resulting generalizations are the relations of ideas that are useful for the future. At the same time they help one identify anomaly that may call for the modification of the disciplinary matrix with additional observations and criteria. This may change prevalent perceptions to bring forth the more enduring world-views.

Ways of knowing. Broader participation and a wider range of inputs is desirable for any search. The scientific, industrial, and information is based on use of tools that facilitated wider participation. For the developments from the past consider the roles of explorers, field stations, navigators, hospitals, laboratories, observatories, museums, marketing, regulations, standardizations, integrations, merchants, and consumer acceptance (Pickstone, 2001). Each created independent measures of the observed reality in relation to the consumer of the knowledge. Educators perpetuate the knowledge. Crafts make it relevant in the local context. The media integrates the development into the culture. Critical interactions and feedback is promoted by peace and prosperity. War and beliefs have their own way of influencing g such contributions.

Threats to knowledge. The biggest threat to knowledge is secrecy and omniscience. Wars hijack and corrupt if not disrupt the process. Such disruptive forces often disfranchise and alienate many from participation. A polarization of dialectic hinders free inquiry. Subtleties that hold complex systems in working order are lost if open inquiry is considered inadmissible. Denial takes an upper hand if accountability is sacrificed. The long tradition of collusion between the state and dogma still has a grip on the minds of many of the world leaders with messianic or Platonic visions. Life is too short to dwell on such foolhardiness.

Prematurity. Decision to act on the basis of incomplete knowledge is integral to any real time decision making as for the business decision, speculations, growth and development. Timing may not be everything, but it is undeniable that in most spheres of life timing the actions can be critical if not a matter of life and death.

The cost from misplaced and premature decisions implemented in the public Commons of the knowledge can be

astronomical. Consider the conception of omniscience that has terrorized and marauded humans for the last five or more millennia. It continues to terrorize people psychologically and intellectually, if not physically. In most parts of the world, we have learnt to minimize the impacts of such certitudes. Yet most do not dare to challenge it validity. Is it the faith or the fear? How do we arrive at certitudes in the absence of valid evidence? *Perpetual I don't know* may be a prudent course if the risks are high. Prematurity also has associated risks and rewards just as sneakiness, deviousness, prudence, and risk-taking. The unsuccessful are wiped out.

On sale to steal the moment. How often do you get a feeling that what you are told is because somebody feels that they are supposed to tell you? News hour is to be filled whether there anything of significance to report. How much of what politicians' say, even when not under duress, has to be discounted because it is inconsistent with what they said moments before? Savory and unsavory mixtures of facts and fiction in the private and public discourses are the devices to steal the moment. Often the hope behind such tactics is that the victims will not notice it, or forget about it, or that can it be somehow denied when the time comes. Look for the fine print of the buyer be beware.

Who own ideas? Innovations build on the past. Progress is about better ways of knowing to control the outcome. A useful measure of history comes not from the individuals at the helm, but from an account of the better ways of knowing and doing thing by ordinary people. What used to be a free flow of ideas to generate more ideas in the public commons is now threatened with the intellectual property rights. To an extent it facilitates flow of certain products. However premature claims also threaten other viable alternatives.

The very concept of the claim of ownership of intellectual property ignores how ideas are created. The device is for the convenience of paddling the products in a controlled market. What is wrong with that? To put it simply: the practice encourages only certain kinds of ideas at the expense of many others. MacWorlds feed only on the frenzy of their own success while sapping the resources and nourishment for many other products. Such practices fundamentally change the identity and focus of the pluralistic creative processes. Recall that machines were supposed to liberate human from drudgery until most human became slave to gizmos. As for innovation, it often means packaging the commodity in certain usable forms – like the bottled water that is invariably the filtered tap water sold at 1000 times the cost. According to the Bottled Water Association, *The bottled water is no more unsafe than the tap water.*

The Commons. There are encouraging trends in the intellectual property sold to consumers. The song-and-dance that was monopolized is beginning to succumb to the innovations on the internet commons. It has also encouraged other forms of works of creative expression which do not adhere to the normal of intellectual property.

Even in the past ideas of ownership and profit motivated innovations have been blatantly unsuccessful in dealing with general education, public and social services, transportation networks, public lands, natural resources, knowledge base, libraries, technologies and certainly the enterprises of sciences, arts and literature. Such institutions are resources for affordable services on the basis of need rather than the ability to pay. More value is being created in such environments. Such contributions in an open environment come from diverse sources as well as the users.

There are down sides. Vision of universal education through radio and television has degenerated into a medium of mindless entertainment. Some will be surprised to hear that the single biggest paid use of internet in USA is for accessing the pornographic material through cyberspace. I am sure it is much large than the hit rate for the free OpenCourseWare from MIT for its course material.

Global commons. As part of the human heritage, the Commons of viable ideas and technologies unleash creativity by lowering the cost barriers and by freeing people from drudgery to pursue other interests. As certain ideas resonate with experiences of many to find a place in the Commons of knowledge, other more seminal works remain dormant for long time before they resonate. The difference is accentuated by the market place.

Serious concerns have risen: What is the cost to the Global Commons? Who is responsible for sustaining the commons? What is derived from the commons? Who own it? The lessons from the industrialization and exploitation of the natural resources are blatantly clear and unequivocal. Homogenization in the guise of globalization is also a hindrance to the interactions critical for the creative and innovative processes that rely on a free flow of ideas and information, as well as on the freedom to develop and try out ideas in the local context. There is a deep structural relation between survival and relationship of an organism with its niche environment.

An insidious contradiction of the intellectual property is that it restricts access to those who provide resources and meaningful feedback. Public commons is the ecosystem of information, knowledge, ideas and learning that rely on free flow and exchange. The feedback is integral part of the discovery, creativity and implementation. All of these thrive on unregulated

spontaneous interactions and sharing tangible information. Nor does its value erode with use. In fact, sometimes the value and information-content increases as its relevance is better defined. One does not loose information by sharing, as might be the case with a commodity or even a tool.

III-33. Equation for Potential

At times it is necessary to provoke to evoke thoughts and scrutiny for response and even action. If something bothers you it may touch some deeper cords. It can be used as a template for self-evaluation, develop a strategy for organizing thoughts, setting priorities, identify issues, and chart a course of action to do something about whatever surfaced. Such decisions may have long term and long range influences and consequences. You may get a second chance only if you are lucky.

No, if you do'nt. It is a generic response to a whole variety of questions: Is anybody watching? Does anybody care? Does it matter? Such questions do not necessarily originate from myopic, skeptic or alienated world-views. Nor are they part of the mystical or spiritual visions based on psychological needs. The underlying sentiment relates to an enduring issue: Relationship of individuals with ones feelings and the rest. In a very constructive sense it is dialog.

A dialog between the self and non-self is critical. It is the only way to develop individual objectives, set priorities, and evaluate resonance and dissonance from the world (Commons, society, market-place) and our experiences. Only when guided by sum total of our being we realize that not all products in a market-place are desirable or even acceptable. Suitable choices are possible if the appearances and warrantees can be scrutinized. Through critical measures we seek significant and meaningful options and choices for actions and behaviors. Very few choices come with guarantees. We also have to search through the implied for reliability and relevance. As one learns to peel frill and

fantasy from value, it becomes apparent that sales talk is just talk unless backed up with a meaningful walk.

Decisions about the future are often made with a limited sample of the present and with little knowledge of the future. We rely on the ability to recognize patterns and trends: *Where there is one ant there are likely to be many more.* One clearly takes a bigger risk if decisions are based entirely on the past, or a sales pitch, or one of a kind. How to deal with the dubious?

A decision to accept something for the long haul requires consequence evaluation. In a generic and generalized sense, it has to be in accord with the reality and offer tangible value. In designing a support matrix, look back, sideways and forward. Certain terms consolidate past, others break new ground, and still others take into consideration the future. Desirable terms propel opportunities towards growth and independence, and prevent errors turning into mistakes. Depending on the cues tragic events can be turned into tragedies or into the opportunities.

We often hear about the level playing field. It is about the same starting point, rules of the game, and the way rules apply and to whom. The terms that often appear in such considerations are grouped below. Not only they carry equal weight for all but they are also not linear or apply equally well to all individual situations. However, their relative importance is clear.

Support matrices. Broader influences shape and drive what we aspire to be. What we become are the products of the commons of knowledge and also of other forces and resources from the commons. Support structures in the guise of socialization include relatives, friends, teachers, and peers. For the broader influences consider the spells cast by of family, tribe, caste, education, economic group, nation, wars, diseases, technologies, dogma,

cultural practices, entertainment, literature and much more beyond the accident of birth.

Power relations. These build access to the resources from the Commons. Used at critical juncture they build momentum.

Multipliers. These are often the personal attributes of intellect, abilities, talents, health, and credibility. They help in learning from the experience of others. They offer opportunities for jumps (gains or losses in steps). Consider the opportunities provided by influential books and ideas, interactions with suitable groups, and good advice heeded at the appropriate moments. It is what we emulate while learning from the experiences of others.

Additive terms. Such measures maintain status quo while learning from ones own experiences. Clearly, it is a necessary part of holding on to the gains.

Glass ceiling and niches. These are the barriers that exist in all enterprises that confine ideas, goals and aspirations. Some barriers are more real than others. Some are wishful and others are rooted in what we do not know or cannot know. The real ones are integral part of the framework put in place for the various forms of exploitation. While it is critically important to be aware of such limitations, often opportunities also lie in such niches of contradictions and inconsistencies. Since the glass ceiling is often a local phenomenon, it is conceivable to grow out of the environment as one grows out of clothes.

Key to recognizing the significance of such terms in specific contexts is to identify specific factors and their relative contributions. Integrated outcome is of course based on how the terms add up with suitable probabilistic and deterministic considerations of the individual. Some orthogonal examples include:

Accident of birth. Once born there is little an individual can do about the historical time line except try to make the history in terms of what lies ahead. Such concerns are about what we get from our parents and environment in terms of the economic opportunities and social skills. Irrespective of the circumstances of the birth, many people have influenced the course of history as well as lives that followed. Drive to overcome limitations of the geography of birth is probably what brought humans out of Africa about 60,000 years ago. The wanderer's lust is only subdued by the uncertainty of opportunities elsewhere. As a result the influences that now shape support matrices for all humans include virtually all the remarkable inventions that have changed the course of developments in agriculture, animal husbandry, medicine, transport, social organization and fields of knowledge and decision making.

Inherited genes. One does not choose ones own parents. There is little that can be done about it after the birth except to nurture and maximize the utility of what one inherits of nature and nurture. It is also relatively rare to find humans with true genetic limitations that interfere with useful lives. By most accounts for most people nature provides far less than what can be made up with nurture. Earlier conceptions of inherited attributes and race were distorted measures of humans to empower few.

Diversity of the gene pool in the commons is critical for survival with the changing conditions. In-breeding may keep the control of the resources in the clan or tribe but it also encourages the structural defects and progeny of imbeciles. There is buzz about the designer-babies with specified color of the skin, eyes and hair, shape of the nose and other body parts. Even when a market or expert consensus emerges about such features, experience with the genetically engineered food crops suggests

that they do not have lasting benefits or survival value for the organism. More to the point, one does not know how to evaluate the evolutionary significance of the specified genetic changes. For such purposes nature relies on random trial and error. It may be better to stick to plastic surgery.

Limitations of attitude. Attitudes determine the accessible parts of the support matrices. For example, by starting with an all-knowing attitude one understands noting while closing viable options. Ability to keep an open mind is about keeping the options viable.

Decisions do matter. Experiences conspire and chance events matter. However, once recognized, it is often up to the individual to do certain things to achieve certain ends. Decisions are about making such choices. Tragic events are facts of life but avoiding tragedies is about key decisions at critical junctures. It is often difficult to see the nonlinear trajectory. Epics, literature and anecdotes from all cultures emphasize such themes. Reality lies in continuing vigilance even if we wish to celebrate the happily ever after.

III-34. Why I Am Not Moral

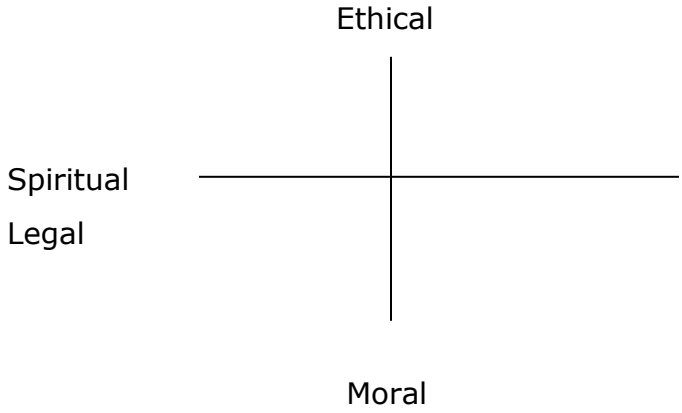
Ethical behaviors require taking responsibility for own actions and their consequences, whereas moral, legal and spiritual behaviors conform to *higher authority*. In a perverse way tribal mores deny conflicts between the self and non-self. If not-killing is an ethical act that weighs wellbeing of *non-self* or *other*, even if slaughter may be deemed moral for the good of the *self*. Moral imperatives to build tribal (group) identity may be about how one treats friends. Search of empirical reality by trial and error builds on personal (internal) identity that also considers how one treat enemies. Ethos of superposed worlds of self and other offers a broader framework for consequence evaluation to create value and realize potential.

There was history before the word history was invented. Concerns about human behaviors also precede words that we continue to search for prescribed and proscribed behaviors. Terms like moral and ethical are often used interchangeably and sometimes synonymously to communicate dialectic of right or wrong, good or bad, fair or unfair, or even life and death issues. My friends who indulge in such concerns would not call me immoral. Very few would characterize me as amoral because of my deep-rooted concerns for all beings including humans.

However what inspired and guides me more than the usual martinet of moral behaviors and concerns. I am not indifferent to the concerns that get the moralists riled up, although I do find myself in disagreement with their methods and conclusions. The buzz of Moral-Values by Mr. Bush during his 2004 presidential bid was neither about anything of value nor about anything moral. It was a glue for the voting block of born-again faithful. Within a year after his election an opinion poll found that two third rated President Bush as unethical, and neither trustworthy nor honest. World is still trying to recover from his legacy of war and economic debacle.

The 2004 US election gave me a pause to think about what it is that I do not like about the word moral. I have not found anything that explains to my satisfaction what a moral-value is, and its behavior consequences. What moral means alone or in association with many other words? What behavior consequences emerge from such associations? Along these lines, over the decades I have often found myself at odds with my religious friends. No matter how I tried to explain my concerns, I have not succeeded beyond the superficiality of the words like moral, ethical, or religious because most people use these words interchangeably and consider them to be synonymous to express something that they can not express otherwise. This was also the case for me until one day I said: "I live by ethical precepts rather than by moral prescriptions or religious dogma of one persuasion or the other." I prefer to be ethical rather than moral or religious and the *Dhamma* construct of Ashok (see Appendix) is closer to my understanding of the ethical

basis of *Dharm* or the code of conduct for personal and social behaviors.



The polarity of moral versus ethical is orthogonal to the polarity of spiritual versus legal. To begin with spiritual and moral frameworks are based on personal choices, whereas as the legal and ethical concerns are social concerns based on shared knowledge. Moral and legal frameworks are based on the existing values and experiences of the tribe. Such frameworks guide future behaviors, and essentially exclude individuals from the decision-making. As increasingly powerful institutional teeth deal with the miscreants, there is also greater need to dispense legal justice fairly and squarely.

On the other hand, the crux of 'moral versus ethical' is in their utility to guide future behaviors. Spiritual or moral self-realization is not just evaluation of self by some fixed criteria. Consider a dog who thinks that his master is a god because he is so caring, or a cat who thinks of itself as a god because the care-taker is so good. I refrain from going into models, idols and superheroes created to proselytize the innocents. Such conceptions of Theitistical darkness may be bliss but hold

of ignorance facilitates little else. Curious and informed judge the significance and the courageous decide course behavior that creates value through open-ended empirical search through trial and error while building on such experiences. Not only it requires ethical conduct but it is also a unreasonable course for ethical behavior.

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Most will agree that acts of infants, imbeciles and insane persons do not have moral or ethical quality because they do know not better. The same applies for coerced actions, including the restrictions of group morality such as: *In a blood feud side with blood kin; intelligent rascals work for the community good (mixed with self-interest); often there is honesty among thieves and gangs; some cut conscience to fit prevailing fashion.* In the same vein, term-papers and SAT essays written for a fee are already accepted more for more than half of the students and parent. Economic forces of clan stabilize group moral authority to dictate individual behaviors. Such behaviors serve the interest of self via the socially extended-self. Authority in the guise of personal morality hides intentions. It is not an aberration that war affords such opportunities to the unscrupulous. Insidious grab and greed for the resources entrusted to corporate executives is not uncommon. Human history is littered with justified moralities to rationalize and hide baser impulses with high-sounding standards and traditions.

Consider justifications for belligerent actions through a conviction of overt or covert moral superiority. The practice has not disappeared with the crusaders, colonialists, mercenaries, and missionaries. Moral quest for the good or right continues to guide major political

decisions by the ideologues right to the dawn of the 21st century. It is skillfully, but not too subtly, built into the smoke and mirrors of words of mass deception (WMD). Depending on what is politically correct, the authority of such *a priori* derives from Omniscience, Grace, Universals, Destiny, Justified-true-belief, and other ad hoc idealizations of past practices. Such platitudes of the higher moral purpose permeate calls for civilizing the barbarians, missionary zeal for rescuing the unwashed and giving salvation to the dead. Manifest Destiny as the Burden of White Men continues in the calls for Human Rights, democratic and market reforms, globalization. In all such cases, consequences are judged, rewarded, pardoned or punished by something external that oversees the higher purpose.

Decisions are lot easier if the consequences are no longer the responsibility of the individual. By drawing a sharp line between self and non-self, morals take out accountability as a concern for behavior. Not surprisingly warring parties invariably justify their actions as moral acts. A bomber pilot is not responsible for the consequence of the sorties if he is ordered to do so and he merely takes-out the target. Such sinister dimension of Kill-Kill distinguishes morality of face to face beheading, suicide bombing, and surgical strikes by helicopter gun-ships. I am not sure if proponents and perpetrators of war loose sleep over deaths in the ranks of the cannon fodder, let alone mourn the "collateral damage." When does ethnic cleansing become euphemism for religion?

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To differing degrees extension of self evokes concerns for right, good, and fair. Behaviors based on such consideration bring about personal and social changes, or at the very least ward off the ugly and unpleasant. In such contexts what distinguishes ethical from moral? Clearly, there are areas of overlap. However, I believe that at a deeper level in human psyche ethical is not perceived to be compatible with moral, and vice versa. For one group of people morality is the motive and drive for ethical behavior, whereas others believe that morality is for those who do not have ethics. Another variation is that morality is for the sinners, and ethics for those who do not want to become sinners. Another dialectic is: *If going to war is a moral obligation, conscientious objection is an ethical act*. If there are similarities of the goals the desirable outcome of such actions and their behavior consequences are often very different.

Even without going into the meaning, significance, and rationality of behaviors, genesis and behavioral consequences of a moral versus ethical frame are different. Most dictionaries do not adequately distinguish moral from ethical: One treats "ethics as the study of morality." Such dictions of denotations are dead abbreviations that often verge on circularity. In any case, a word representation is mere necessary first step for grasping relations through symbols. The concept space of the identical, synonymous, and interchangeably used words evolves through usage as the distinctions are sharpened through polarized dialectic and derived behaviors.

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There is widely recognized social need for viable code of conduct. Over the millennia this need is addressed by traditions captured in religions, dharma, codes of conduct, and laws with differing degrees of authority and judgment for implementation. Such a moral choice is probably best illustrated by words of one of the most enlightened Christian reformer: *What harm would it do, if a man told a good strong lie for the sake of the good and for the Christian church... a lie out of necessity, a useful lie, a helpful lie, such lies would not be against God, he would accept them* (Martin Luther). Possibly for such reasons Christian Churches approve of 'mental reservation' or 'internal disclaimer,' i.e. telling half-truths if the other half is repeated inaudibly in mind. Is this the reason for the common practice of keeping fingers crossed while not telling truth? Such morally justifiable and legally admissible lies are unethical deception.

At another level consider the thought and practices of the followers of theistic religions (Judaism, Christianity, Islam, and to a lesser extent the Vedic or Brahminical Hinduism). They have differing moral values at odds with themselves and the neighbors. To appreciate the extent of such encroachments on the self consider the moral dilemma that an observant Jewish space traveler would have in finding the direction to face for prayer. Similarly, an Islamic devotee would have a moral conundrum in setting the prayer time on a spacecraft that circles the earth every hour.

The point of a code of conduct based on dharma is to facilitate search of 'the truth of existence' by extending individual self (*atm*) into the non-self. Since the past actions can not be undone and their consequences have

to play out, the focus of the search remains on the future behaviors. Nor can actions be judged (or undone) by some indescribable universal (*Atma*, *Brahm*, Soul, God, Omniscience) that may clutter brain. Ethical courage follows from personal stand congruent with the shared knowledge. Here sum total of existence is made up of personal perceptions of the reality of the self and the non-self. Mahatma Gandhi took a cue from these ancient paths when he advised a sectarian killer of the parents to raise the child in the tradition of the other sect. He also convinced the British that their moral (and legal) ways are untenable because they are not ethical.

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With the explosion of easy access to public information and snooping concerns about privacy and personal behaviors are being reshaped in the global village. a society is either to conform and behave *normal*, or to remain beyond reproach.

The distinction between religion and dharma persists at deeper levels of searches of the non-self. Dialectics of moral versus not-moral, or religious (theistic) versus not-religious (not-theistic), raise quite a few antennas. I quizzed many of my friends to articulate the way they distinguish ethical from moral at the gut level. Not surprisingly some believe that there is little difference, whereas others see little overlap. Some believe that the problem is not religion but the creed and dogma that create tyranny of social pressure for morals of dubious value. Origins of morals, and for that matter of organized religions, lie in the *a priori* of mores (Latin) rooted in customs, creed, tribe, tribal elders, ancestors, almighty, supreme, or whatever universal one wishes to

invoke, worship, or surrender to. In such cases, a God-Head external to the individual provides inspiration, affirmation and justification in the form of prescribed and proscribed behaviors. In a more parochial sense, following their origins in the biblical tribes, the ancient mores verge on dogma of organized religions designed to look after the interests of the tribe of the faithful. As if to increase their count hereafter, even at the dawn of 21st century moral enthusiasts of a certain Church poach the souls of the dead, including the Holocaust victims, who were never the followers of their Church.

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Western scholars of ethics have failed to define its scope. Apparently the Greek term ethos was coined to consolidate a variety of overlapping attributes. During the Archaic and Presocratic period -800 to -400 (BCE) such attributes included (with approximate translation): *psyche* (soul), *arete* (excellence) and *dike* (justice) controlled by *noos* (insight), *phren* (wisdom, deliberation), *thumos* (awareness of behavior), logos (speech and expression) and matters of heart (*kradie, etor, ker*). Following the lead of the *Will of God* the primary concern of Socrates emerged as *ethics of morals* (to guide the mortals). He did not detach ethics from the organized religion that was beginning to take hold on the Eastern shores of Mediterranean. In fact, Socrates, Plato and Aristotle did not dare to go against the prevailing mores as well as the authority of the tribal God of the Hebrews who dictated: *People is to have no other god, and Yahweh is to have no other people*. In their attempt to reach out, the Hellenistic thinkers developed the role for Zeus as for Yahweh to deliver justice for the past actions. Only fear of

punishment by a judgmental god would guide the future behaviors. This encouraged righteousness in public behaviors: A right relation with the god through faith extends the reach of the (god-given) laws to control others. In the image of their God, the Hellenistic thinkers, and their followers until recently, justify slavery and promote elitist world order. Ideals for select few became the popular ideals to aspire for. Along these lines one hears about moral concerns about decency, right, good, justice, piety, virtue, and nobility and their institutionalized and legalized artifacts. Whether morals transform a religion or a religion raises morals remains debatable.

In any case such concerns are not about the fairness, equity, symmetry and reciprocity in behaviors that lead to integrity and trust as part of the social contract. By the fourth century BCE Hipias the Sophist and Diosgenes the Cynic began to look beyond the Hellenic provincialism ("polism") to the cosmopolitan ('citizen of the world') of Hellenistic colonies. The idea has evolved as a nebulous core that guides toward a broader social being with the idea that all human beings, regardless of their political affiliation, belong to a single community to be cultivated. Possibly to further the Greek interest in their colonies this community has been envisioned with differing focus on political institutions, moral norms, shared markets, or forms of cultural expression. The concept appeals to the architects of moral (Universalism), political (World-citizen), and market (Globalization) hegemony because built on uneven playing-field such institutions are tools of exploitation.

Consider the juxtapositions: moral authority, moral standards, moral principles, moral imperative, moral turpitude, or moral superiority. In continuing the ancient Greek thought even the most progressive of the Western thought has not freed itself from influences of ad hoc universals built into the socially decried idealizations, assumptions and goals of inquiry. In the broader context of human society, moral of a particular brand are relativistic. What does it mean to be more or less moral? Who determines? Like the natural and moral laws, idealizations continually evolve and often swayed with the direction of the political and economic wind (mores).

Many people find it necessary to have a moral code of conduct rather than building an ethical one made by humans for humans. To be moral requires knowledge of what is right and wrong, good and bad. A moral code built on a selective record of the past successes facilitates decision-making by giving an appearance of certainty. Having moral guideline simplifies life. It makes one feel good to be obedient or faithful because that does not require justification in itself. Is it enough to be guided by a prescribed code? Is there a need to take charge of ones own affairs or for a personal or social change?

Personal morality is oxymoron. Followers of a moral path often fashion themselves in the images of their ideals. Social pressures undermine the personal choice of acting or not acting. In a tribe of cheater and killers it is moral to be one. Such pressures of the righteousness are promoted by the imperial attitudes, call for crusade or Jihad, and call for missionary do-good. How many of those driven by such moral certitudes are

willing to give the same benefit to objects of their moral tinkering?

Moral certitudes for the social change are fundamentally asymmetrical where the participants can only be guided - presumably because someone else knows better or *what is best* for others. This aspect of moral drive still engages the Western thought: Behaviors for the individuals as well as for the institutions are structured largely on the basis of some ad hoc universal. Consider the moral perch from which pronouncements are made to the unsuspecting millions not only for the religious or political indoctrination, but also to sell human rights, democracy, market reforms and globalization. Consider the moral codes that continue to drive the international policies and behaviors to serve the interest of a chosen few. As people forge themselves in the image of their ideals, they also mould their gods (values, ideals) to suit their interests. More often than not, moral ideals prey on our desires to be something that we are not. Are such platitudes designed to empower a few?

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In search of solutions that fit the problem, moral behaviors center on the mores of the land, whereas ethical behaviors driven by ethos or truth of existence. Most people will agree that differences between the moral imperatives of the groups of people far exceed the range of ethical precepts of individuals. To perceive the differences, think of a hypothetical compass one may use in a quest for desirable behaviors. In order of equity and symmetry, ethical behaviors for relating self with the non-self are guided with the polarity of fair or unfair.

Prefixes and suffixes rarely amplify the reach of ethical. Like its origin even the current usage of the word ethical has kinder and gentler connotations. Ethos (Greek) of life through the experience of living finds its way in the ethical codes of conduct without moral imperatives and certainly without judgment. In searching truth of existence (the *is-so* and its potential), dharma derives from the perceptions that enrich experience of living and the ethos of life. In ethical behavior, by taking responsibility for ones own actions and bearing the consequences one wrestles with more difficult and subtle issues of equity, rightness, and fairness, and their symmetry. Such stages in the evolution of the self that bears consequences of actions has been varyingly described as The I, Atm, Mind, and lately the Neuronal Self.

The moral polarity of good or bad, or even right or wrong, encourages righteousness. Moral eminence is about virtuosity and nobility. Proponents of moral behaviors are often all too happy to enforce their beliefs on the others. They are unlikely to give the same benefit to the others, or even listen to the other side. For sharpening the differences consider how ethical sensitivities and sensibilities diverge from the moral standards applied for stem cell research, or the right to choose abortion for whatever purpose, or to select sex of the fetus. In such debates the problem is forced through templates of moral dictates of only those who speak out. Instead of the social front the ethical focus is on the underlying concerns.

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One rarely hears about the ethical values or ethical ideals. Yet ethical considerations provide a general structure for decision-making and consequence evaluation to address specific problems. As a shared quest, the primary ethical concern is for behaviors guided by internally acceptable criteria of fairness, equity, reciprocity, and symmetry. Shared concerns for ethical behaviors are also guided by the shared knowledge. From this starting point bounded rationality is built on collective experience. Within such bounds ethical behaviors are likely to be a personal or group affair with an emphasis on practice and feedback. Ethical conduct is judged in the context of the past consequences, however the emphasis always remains on the perceived future. Since individual actions are guided by perceptions, responsibility for decision-making and consequences of actions also lies with the practitioner.

Ethical choices are to be built in the individual character motivated by the reward of fairness as the right thing to do. In choosing an ethical solution from the matrix of viable alternatives, with the compass of fair and unfair, requires symmetry and reciprocity in the behavior equation. What follows from such perceptions is intriguing. The role of equity and reciprocity in developing human potential has prepared ground for social contracts for the evolution of organized society. It extends from the traffic rules to the Bill of Rights and Constitution as the statement of principles to aspire for, if not to live with. Through democratic institutions one aspires for democratic ideals, presumably with an *a priori* for fairness and equity for all. Doubt and skepticism motivated by fairness keeps a watch on ulterior motives.

A theory of any kind can not emerge if there is positive belief (bias) for what is right and what is wrong. In the end, concerns to guide future behaviors are not about just thoughts and words. These are concerns about consequences of the chosen course of actions and behaviors. All conduct and behaviors resulting from non-random actions are subject to ethical concerns. Status quo of moral guidance is not satisfactory because morals are about habitual and customary standards, whereas ethical actions and behaviors require consequence evaluation with equitable symmetry and accountability. Specific models and theories of moral sense emphasize the boundary conditions only from dialectical perspectives motivated by *selfish, Kantian, utilitarian, spiritual (reflective), or Natural Law* perspectives. Along these lines religions, as well as some of the alternative constructs, are conservators of group values by upholding the moral standards. Often one needs to outgrow the habitual.

My search for extending the self into the non-self has taken me from a reaction of *Why am I not moral* to a better understanding of *Why I am not moral*. Ethical sensitivity begins where the legal boundaries are not drawn and moral responsibility ends. Here not-moral provides the defining identity to the ethical. In this journey the point is not to pocket the truth but to chase it. It is not just a matter of ethical gesture to give a voice, but it is the ethical responsibility to move over and let other voices come through and to let others speak for themselves. A need to take charge for one's own actions extends the rational self into non-self by dispensing with authority for consequence evaluation. Conflicts raise

ethical concerns, and emerging dialog offer opportunities by challenging the assumptions. Could it be that, in search of solutions that fit the problem at hand, ethical considerations guide through a wider range of structures rather than those can possibly be encapsulated in the mores? At the very least ethical searches are forward looking and allow for midcourse corrections with decisions guided by concerns for equity and fairness rather than the changing perceptions of right or good. Ethical thought requires that we struggle with ambiguity to resolve doubts. Ethical path seems more blurry and difficult yet it is a better guide for more place and times because it is likely to be rooted in reality. It 'feels right' because it is often based on shared-knowledge, and designed to deal with evolving perceptions of potential consequences, their values and significance. There are no easy ways out of making own judgments and living with the consequences and modifying future behaviors.

Tribal constructs are the subsets that seek validity within the ethical framework that facilitates evaluation of utility and consequences. As a limited subset, morals are fashioned to deal with concerns of the Self - the personal, familial and tribal. It is not uncommon that such explorations tangled in theological and spiritual a priori turn into moral conundrums of dilemma and paradoxes. Without room for reason and doubt, another limitation of moral constructs is the asymmetry of the assumption that the rest of the universe has no right to be different. In fact such differences are treated as threats. Thus neither moral nor the moral values necessarily create value. On the other hand value can not be created without reasoned ethical behaviors. Such a framework is intrinsic in all

dealings of self with the rest. Just as technology begets technology, tangible philosophies create value when thought, decision, action and conflicts are harmonized with behaviors rooted in reality. In the end, if human animal is by nature capable of rational ethical behaviors, it is philosophically human if it does so in a reasoned way.

Acknowledgments: I am grateful to numerous friends who helped me sharpen the arguments. I also benefited from scores of published books and articles. Two of these (Dewey and Tufts 1932; Sullivan 1995) provide good entry points.

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Dewey, J. and J. H. Tufts (1932). Ethics. New York, Henry Holt and Co.

Sullivan, S. C. (1995). Pyshological and Ethical Ideas: What early Greeks say. Mnemosyne, Bibliotheca Classica Batava. Supplementum; 144 Leiden; New York: E.J. Brill.

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Consider the following provocations for fun and thought.

Slavery: Is it *Ethos of sufficiency for dependent existence*?

Racism: Both slavery and racism have been justified as moral.

Human-sacrifice: Would you kill another human being if not illegal to do so?

Animal sacrifice: Would you eat a cow if you were to kill it? How about other animals? Where do you draw the line?

Would you hand over a refugee? What about if the refugee is innocent; or if the conviction is wrong; or if the pursuer is mis-guided? While it may be moral to come to defense of friends who did wrong, it is unethical. Also it is better to keep ethical friends who are less likely to do wrong.

Jumping a traffic light: Would you jump a red light if there is no traffic in other directions and there was no police on petrol?

Justification for use of power: Which is more compelling: political, economic, potential, general good, higher purpose.

Abortion: Is mindless sex justifiable? Is abortion justifiable for the selection of the sex of a baby?

Group morality: When is it acceptable? Should we do the "right" thing for the wrong reason or the "wrong" thing for the right reason?

Situation ethics: When is it acceptable?

Justice: Which one is more acceptable: As the privilege for the person belonging to a group? How about for a person that does not belong to the group that is judging? Is strict law better than natural law? Is jury trial better in such cases? Is it is ethical not to charge a person for murder on grounds of temporary insanity? Are shared moral concerns also the shared ethical concerns (Sharia)?

Geneva convention: As extension of mores it includes others with the expectation that all will do the same.

Cheating. Term paper or SAT essay written for a fee is the current mores or practice among 70% of the students. Such practices are common in cartels, environmental pollution, CFC use, and not signing the international treaty to control green house gases.

Yoga and meditation. Yoga and such devices for self-help sensitize the self. Further education and socialization are needed to relate to the vast non-self.

Finish what is on your plate. Consider the ploys used for not wasting food that range from people starving in countries Albania to Zaire, or whatever is politically convenient at the moment. Is it related to indulgence and overfeeding that appears to have caused epidemic of obesity? At the dawn of 21st century, throughout the world more people overeat then are calorie malnourished.

Legal asymmetries. Nobody is above the law. Within these limits weight of the legal system ends up with major wrongs. Does the asymmetry of *identify the source or go to jail* has ring of what has put many innocents on death row. Charges of unpatriotic treachery are often labeled against those who inoculate people against social and political ills.

What is good for goose is good for gander: If you know what is good for you, then you also know what is good for the others.

In the end: What is more appealing: Who you are? Or What you are? Can you be either without a social or cultural context.

Appendix

Excerpts from Edicts of Piyadassi Ashok (ca. 265 to 230 BC)

[Dhamma: A secular social code of conduct and social contract for peaceful coexistence].

- The beloved of the Gods, Piyadassi the King, has had this inscription on Dhamma engraved. Here no living thing is to be killed or sacrificed. Piyadassi sees much evil in holding of festivals. Killing of animals in the Royal kitchen is also reduced.

- Medical services for the care of humans and of animals have been provided in the domains of the Piyadassi and the neighboring kingdoms. Medicinal herbs have been planted where they do not grow. Along the roads wells have been dug and trees planted for the use of men and beasts.

- Officers of the state will go on regular tours for other duties and to instruct and explain Dhamma to people. It is good to be obedient to one's mother and father, friends and relatives, to be generous to Brahmans and Shramans, not to kill living beings, to spend little and own minimum of property.

- Standing firm on Dhamma the king Piyadassi, his sons, his grandsons and his great grandsons will advance the practice of law until the end of the world. But there is no practice of Dhamma without goodness, and in these matters it is good to progress and not to fall back or be satisfied with shortcomings.

- It is hard to do good. He who does good does a difficult thing. But he who neglects my reforms even in part will do wrong, for sin is easy to commit. I have appointed officers of Dhamma for the

welfare and happiness, and administration of charities among those devoted to Dhamma. They are busy in promoting the welfare of prisoners should they behave irresponsibly, or releasing those that have children, are afflicted, or are aged. May it endure long and may my descendents conform to it.

- At all times, whether I am eating, or am in the women's apartments, or in my inner apartments, or at the cattle-shed, or in my carriage, or in my garden's - where ever I may be, my informants should keep me in touch with public business. Thus everywhere I transact public business. Any dispute about anything I order is to be reported to me immediately at all places and at all times. I find no satisfaction in the hard work of the dispatch of business alone. I consider that I must promote the welfare of the whole world. Hard work and the dispatch of business are the means of doing so. Indeed there is no better work than promoting the welfare of the whole world. Whatever may be my great deeds, I have done them in order to discharge my debt to all beings. May it endure long, but this is difficult without great effort.

- Piyadassi wishes that all sects may dwell in all places. All men seek self-controls and purity of mind but have varying desires and varying passions. They will either practice all that is required or else only a part. But even he who is generous, yet has no self-control, purity of mind, gratitude, and firm faith, is regarded as mean.

- People, especially women, practice various ceremonies and rituals that are trivial and useless, doubtful and ineffective. On the other hand, effectiveness of Dhamma is lasting --- because it

makes possible for people to escape evil inclinations. But this is difficult for men, whether humble or highly placed, without extreme effort and without renouncing everything else, and it is particularly difficult for the highly placed.

- Piyadassi honors all sects and both ascetics and laymen, and considers essential the advancement of the essential doctrine of all sects. It takes many forms, but its basis is the control ones speech, so as not to extol one's own sect or disparage another's on unsuitable occasions, or at least do so mildly on certain occasions. On each occasion one should honor another men's sect, for by doing so one increases the influence of one's own sect and benefits that of the other another men. Whosoever honor his own sect or disparages that of another man, wholly out of devotion to his own with a view of showing it in a favorable light, harms his own sect even more seriously. It is the desire of Piyadassi that all sects should be well informed.

- Piyadassi feels remorse that during the conquest of the kingdom of Kaling a hundred and fifty thousand people were deported, a hundred thousand were killed, and many times that number perished. It is also deplorable that the survivors of the war continue to suffer from the violence, separation of their loved ones, and misfortune of others. This participation of all men in suffering weighs heavily on the mind of Piyadassi.

- Since the empire is large, much has been engraved and much has yet to be engraved. There is considerable repetition because of the beauty of certain topics, and in order that the people may conform to them. In some places it may be inaccurately engraved,

whether by the omission of a passage or by lack of attention, or by the error of the engraver.

***Note**: Excerpted from Askok by Romila Thapar (Oxford University Press, Delhi, 1997). Twenty-eight edicts of Ashok are known. These excerpts are selected from the fourteen major rock inscriptions that mainly relate to the thought behind policy of Dhamma. The pillar edicts address more direct political issues, where as the minor edicts relate to the decisions of more personal nature in relation to the Buddhist practices. All but one edict is in Prakrit language in Brahmi script. The Kandhahar edict is bilingual in Greek and Aramaic. This is particularly significant because the Sanskrit Grammarian Panini lived in Kandahar.*

III-35. Unleashing Thought: Taming Brawn, Grunt, and Smarts

Quarterly Review of Biology: 81, 131-139 (2007). A review of Before the Dawn: Recovering the Lost History of Our Ancestors By Nicholas Wade, New York, Penguin Press, (2006).

Who really knows? Who will proclaim it? Whence was it produced? Whence is this creation? The gods came afterwards, with the creation of this universe. Who then knows whence it has arisen? Whence this creation has arisen - perhaps it formed itself, or perhaps it did not - the one who looks down on it, in the highest heaven, only he knows - or perhaps he does not know. As musings (Rigved, circa 1200 BC) of curiosity were established as beliefs, Charles Darwin noted in *The Descent of Man*: "It has often and confidently been asserted, that man's origin can never be known: but ignorance more frequently begets confidence than does knowledge: it is those who know little, and not those who know much, who so positively assert that this or that problem will never be solved by science."

The fascinating story of emergence of human foragers into a complex society continues to be selfnarrated in ever greater detail. By building on external evidence, it is overcoming the unknown, avoiding the paradox of self-reference, and detouring nonexistent constructs. By taming instinctive brawn, grunt, and smarts, humans have managed to unleash the enormous potential of the extant reality. Grasp of the external world facilitates interplay of the external with the internal curiosity and awareness to shape it into cognition with recall. It facilitates shared reasoning to

validate perceptions that ultimately govern choices, decisions, and behaviors. In a nutshell, human evolution is about genes reinforced with language.

Evolution is rooted in the changes in the genetic material that facilitated the descent of great apes from trees. With two limbs free to do other things, in the last 100,000 years, the bipedal ape has acquired distinct abilities. What it could not do on its own, it does so with others and with tools. Apparently, changes in less than 1% of the genes gave graded responses to the vocalization apparatus. Graded vocalization permits interplay of awareness of sense experience with instincts. Reasoning gives time to evaluate and decide whether to act or not to act. Behavioral consequences of verbal communication facilitate a higher level of socialization. Shaped by parallel changes in language communication across the generations, cognitions and perceptions that result from awareness of the present in relation to the past and future are the bases of successful behaviors.

The Tao of the human genome is here and now. What Darwin and Wallace described as the positive natural selection of the increase in prevalence of advantageous traits (Darwin and Wallace 1858) can now be correlated with changes in parts of the genome. Distribution of DNA sequence variations across populations can be interpreted to obtain insights into the genetic origins and relations (Sabeti et al. 2006). Such tools continue to change our way of thinking, how we ask questions, and what we accept to be an answer. Evidence from genes is useful in charting when humans acquired certain traits such as bipedalism, language ability, social organization, resistance to diseases, and other adaptations necessitated by environments in which human

ancestors were successful. As tools and evidence evolve, deeper and broader relations about the ascent of man through prehistory continue to emerge.

Before the Dawn is one of the most recent discussions of this topic. Wade builds on DNA sequence information to outline human prehistory after some of the ancestors of the L3 branch of Y chromosome left Africa about 65,000 years ago. It is an admirable synthesis with wide-ranging facts and ideas to communicate reasoning about how humans came to be what they are. The newspaper style may appear annoyingly recursive and repetitive in places, but as a reporter and storyteller, the author's narrative is for nonexperts. Wade is an erudite messenger of the emerging ideas that are not intellectual constructs of any one particular person, yet the discussion is built within the framework of the theory of evolution. Genomic results are skillfully interwoven with findings from archeology and linguistics. Strengths and weaknesses of each continue to be sorted out in the emerging consensus. Although weak on the fundamentals, with the freedom of a storyteller for curious readers and nonexperts, the author anecdotally introduces evolving ideas of population genetics and molecular ecology to clarify and unify ideas from linguistics, archeology, anthropology, history, anecdotes of facts, and whatever else whether or not politically correct. The message is that the genetic evidence is compelling. Anything that does conform must be reevaluated and recalibrated, but cannot be ignored.

Syntheses of this magnitude raise questions. Plausible scenarios can only be sorted out with wide ranging advances. The problem is interesting and important enough that critical scrutiny will

continue until an acceptable consensus occurs. The layout of the book (or the way of reasoning) is not of a card-carrying academic researcher. It might as well be so. Experts will give their own opinions, and it is up to lumpers and splitters to agree on a viable construct. We are not there yet. However, it is worth taking note of *Before the Dawn*, even if Wade may not be fully aware of the limitations of the methods that relate observed mutations to infer population selection. This book is likely to be more widely read than a scholarly review, with a lasting influence on the direction of thought among the experts (Sabeti et al. 2006).

Genetic evidence has provided better tools to evaluate Darwin's ideas. Mutations in two parts of human DNA are of particular interest in tracing back the human lineage, but different influences are recorded on the two types of DNA. First, the Y chromosome found only in males is transmitted from father to son, and its genes control male fertility. Thus, mutations in the Y chromosome provide a more stable measure of the time-dependent changes that are less likely to be subject to vagaries of environment. Second, the transmission mechanism for primates is such that only the mother's m-DNA is transmitted to both male and female offspring. Mutations in the m-DNA apparently control energy metabolism and, therefore, are more likely to leave a trace of the behavior changes associated with the climatic changes through which the ancestors persisted successfully. Not surprisingly, the genetic measures of matrimony and patrimony do not always match family trees. Since the mother is the only reliable measure of the family line, departures in Y chromosome suggest nonpaternity events (i.e., the biological father is not the same as the father of record). Various measures show that in different cultures, nonpaternity events account for less than 1% to more

than 25% of the births, and the current frequency in the U. S. and European population is approximately 4%.

Useful insights have emerged from teleological rationalizations of the patterns of genetic mutations found in the Y chromosome and m-DNA. They provide a window into the genetic past of the populations to infer human lineage. For example, with sufficient (but unknown) numbers of accumulated mutations, species evolve and go their genetically separate ways when they cannot interbreed. Genetic variations within species arise from fixation of a single nucleotide polymorphism. Over a shorter period of less than 70,000 years, advantageous alleles sweep through populations, and selected alleles become established as haplotype in a chromosomal region. In effect, selection pressure, hybrid vigor, and genetic drifts can amplify a single mutation such that within few generations, its bearers begin to dominate the group behavior. The clock for the onset of each of these mutations has to be set by other independent and reliable means.

Since behaviors are determined by genes, changes in behaviors are coded in mutated genes. About five million years ago, human species diverged from the branch of modern apes and bonobos that share more than 97% genomic similarity with humans. The basis for the difference between the distant cousins is in less than 3% of the nucleotide sequence of DNA. Most of the altered genes have not been functionally identified, but recall that 97% of the genomic sequence is filler and only 3% appears to code for functional proteins. It is too early to even suspect that the filler does not have a function. In any case, it is intriguing that although remaining similar for millions of years, during the last 100,000 years, the genetic and behavioral changes on the human

branch have apparently accelerated. The change appears even more pronounced in a genomic branch traceable to a few hundred people who left Africa about 65,000 years ago by crossing the Gates of Grief at the southern end of the Red Sea. Within 20,000 years after leaving Africa, their male and female descendents reached Australia. Along the way, they populated the coastline of India and the Indonesian archipelago, where a group went south to Australia, and another went north to China and Japan. There is emerging consensus based on the DNA evidence from the Y chromosome of male line and the mitochondrial DNA of female line that the genetic ancestry of all modern humans outside sub-Saharan Africa (more than seven billion strong now) is from this small group of individuals of childbearing age. Their saga is a story of selection through sexually expressed preferences and choices made under pressures of geography, climate, diseases, and whatever else came in their way. In the process, humans have destroyed other species, including other human groups.

This outline of the human prehistory is based on the key result that the L3 variant of the Y chromosome predominates in males from all continents except sub-Saharan Africa. A single genetic origin of L3 in effect rules out separate evolution of human groups, while the L3 variants provide a temporal measure of the course of selection dominated by the local conditions. The interhuman differences of traits and behaviors, often attributed to the races, must have been due to such selection. Here the picture from the bearers of the M and N branches of m-DNA is generally consistent, but less complete. Such early challenges with strong selection pressures included learning to fish, building and navigating canoes, controlled brawls, and defense of territory while maintaining genetic diversity. Additional innovations were

certainly needed as the tropical coastal groups living near the river delta moved up the rivers. The northward migration required genetic changes for adaptation to cooler and dryer climates.

The forces of genetic selection that operate in niche environments often quicken the pace of the observed changes through further selection. It remains to be discovered what accelerated the change, and what role local conditions played in subsequent selection, hybrid vigor, genetic drift, and segregation. Geography and climatic changes are the obvious determinants for color, size, and shape of body. Human choices do matter and have unintended consequences. Random actions in limiting environments cascade in unexpected and unpredictable ways. For example, after humans lost their natural fur, the louse deserted humans because exposed human skin does not provide warmth. About 70,000 years ago louse the recolonized humans, presumably as hosts began to use clothes. Similarly, certain variant strains and species come to dominate in a very short time through the selection and breeding of crops and animals with desirable traits. The converse is also true, as unrestrained human choices continue to wipe out large mammals and human groups within few generations. The rate of resource and species depletion has increased with the pace of human intervention. In this kind of competitive environment, lions and kings are evolutionary dead ends, while ants, cockroaches, and turtles are winners.

Inland migration routes accelerated around 35,000 years ago as the coastal foragers began to move upstream along rivers. Apparently, a group settled in the Sindhu (Indus) valley that was

crisscrossed by the five rivers of the northwest Indian subcontinent near Afghanistan. A branch of these L3 bearers arrived Iberian Peninsula about 25,000 years ago, wiping out the Neanderthals along the way. It is not clear how many of them survived the Ice Age that followed, but their genetic trace is now found mostly in the m-DNA of the groups living along Mediterranean coast. Meanwhile, another group went northeast from Afghanistan. About 14,000 years ago, they reached Alaska via Siberia. Along the way, they populated north central Asia and northern Japan. Near the end of the last Ice Age, they also crossed the Bering Strait to the Americas. This group was selected for a body form with reduced heat loss. They accepted the docile wolf as a friendly sentry and self-carrying source of food-on-legs for the lean times. Adoption of the dog was not the beginning of the domestication of sheep, cattle, and horses. Innovations in the isolation of Americas, like those in Australia or islands, did not make rapid strides. Although confined groups carved out selfsustaining cultures, they could go no farther with minimal human and animal resources and technologies available in their niche environment.

Success beyond survival was built on more. Rudimentary agriculture and domestication of animals was beginning to take hold about 10,000 years ago in the landmass that ws crisscrossed by rivers and bounded by India, China, Iraq, Iran, and Egypt. These conditions were right for movements of people and the transfer of diverse resources aided by language communication. Such adaptation facilitated technological innovation. As Europe warmed again after the Ice Age the L3 Eurasians went west with their agriculture and animal-herding technologies, and the Indo-European languages that continue to this day. Diamond (Jain

1998) has made a convincing case that the Eurasians had the advantages of climatic, geographical, and population resources to innovate through the genetic selection of crops and animals. At all levels, genetic diversity played a role in providing hybrid vigor. Within a few millennia, this group emerged as a complex urban society where regimented behavior required taming instincts. Codes of conduct led to the need of a social contract that cared for its own. Further cohesiveness was coaxed with acts of guilt, demonization, and warfare. Selection aided by climatic and meteorological changes took hold over the time course of centuries. Dominance of alleles that conferred certain advantages has become apparent within few generations as the immigrant ethos of America (Jain 2005). Just as geographical reality shapes behaviors, local contexts encourage innovation from a base of technologies if time is spared from the basic survival needs. Virtually all cultures put aside time and resources for mind-altering activities and warfare. The 30% death rate from wars in the primitive societies matches the 30% resource allocation for the "defense needs" by modern nations. Not unlike the our primitive cousins, modern individuals also spend approximately 3 hours a day for food, and twice as much time on socialization, grooming, entertainment, and snorting drugs. In sedentary human societies, choices take hold that cause survival to thrive by making use of opportunities as they emerge.

Just as economic necessities facilitate real world constructs, they also quicken the pace toward apparently kinder, gentler, and less violent behaviors. Here, deception and destruction are intertwined with “let buyer beware.” Rather than a change in human natures (Jain 2001, 2006), changing contexts requires strategic modifications in the selection pressures modulated with

alliances. We can neither predict what the circumstances would hold, nor what genes are likely to prevail. Time is the only witness of the surviving genes adapted to thrive under the emerging circumstances. Nimbleness is required to deal with such uncertainties and should probably be of concern for those who plan to choose a genetic makeover for their progeny. Like the choices inherent in human constructs of ideals and technologies of yesteryear, we seem to be guided by the promise of choices. Building on the premise of what else may or may not be out there, of course, requires venturing into brave new worlds. Many of them turn out to be paradoxical and nonexistent worlds. Yet few real ones that we venture upon change the landscape of choices by creating real value. Possibly survival for success is this quest "at the threshold of another world like none before." Could it be the basis for directed evolution by design or random selection?

Newspapers report the "gene of the week." If genes control behaviors, what can be achieved with reconstructed genes? Genes code for proteins that are the functional movers and doers for an organism. If random genetic changes tailor proteins to overcome limitations of the existing design, such limitations become apparent only with the survival needs in the niche of here and now. Changes that perpetuate are considered advantageous. Changes that did not work out leave little functional trace for the progeny. It is a long leap of faith to assign behavioral consequences to a certain set of genes on the basis of what happens when a particular mutation is interpreted to be associated with a modified function, handicap, disease, or protection from a plague, pox, or AIDS. Even if the test-tube function of the affected gene is known, its regulatory influence on complex behaviors can hardly be surmised in broad, general

terms. On the other hand, associating single gene defects (Mendelian) with diseases is useful, but such genetic changes may also confer other advantages that may not be included in the evaluation criteria. We know test-tube functions of possibly less than 5% of the genes, and evaluation criteria for less than 1% of these. The enormity of the problem is analogous to a machine that may become nonfunctional due to a particular defective part, and may also be dysfunctional if it is not tuned to function in relation to others in the hierarchy.

In virtually all aspects of human existence, language communication has become indispensable to survive and thrive. An overarching function of language is that it is the only means to share and cross-validate what is behind the eyes (inner world of self) with what is in front of the eyes (external world experienced through senses). Experiences of the inner world are not so uncommon whether through natural curiosity, meditation, bias, dream, or elicited by hypnosis, trans, asphyxiation, sickness, starvation, alcohol, or hallucinogens. Such experiences may bring an individual to "the door of perception'\" or "cosmic consciousness,'" but reasoning and validation are required to weed out the nonexistent constructs that are paradoxical, self-referential, and cannot be relied upon or dealt with in real time. Yet people continue to believe in miracles, gambling, and lotteries even though these are not viable business models. Not only they do not create value, but in all such cases the desired outcome is not assured by specific action. Indeed, it is a paradox of language expression that as such it does not distinguish the real worlds from the imagined.

The transition from grunt and gesture to human language skills is truly unique. Although language consequences are beyond immediate control of genes, positive selection pressures from language skills are remarkable because it is the only means by which inner intentions are expressed. The key genes associated with language ability appear to have emerged during the last 100,000 years. Linguists have tried to piece together artifacts of verbal representation that are embedded in current languages. Linguistic roots of some of the most rudimentary words can be traced back about 8000 years. There is no reliable way to evaluate the significance of such artifacts embedded in the language families. It is likely that Indo-European words developed with the spread of the Y chromosomes of the practitioners of agricultural technology or warfare. Little or no correlation is apparent with m-DNA. Apparently, factors influencing proliferation of a language do not overlap the selection pressure on genes. If at all, few generalizations are likely until it becomes clear how the increase of isolated words is related to the spread of genes.

The vitality of popular cultures shows that the aphrodisiac of vocalization is not just for toads. Certainly most if not all behavior choices boil down to sex. Appearances are often deceiving. Language and speech better mirror the inner workings by which we process inputs to reason beyond the immediate. Language is more than words. Language communication touches virtually all spheres of human existence, or at least public behaviors. Its relationship to specific events in the course of human evolution is unlikely to be straightforward. External political and cultural influences may be retained in the formal written part of languages such as alphabets. However, writing is a relatively recent invention. Very few alphabets were established 2000 years ago,

and we are still striving toward universal literacy. It is also a misnomer to consider Sanskrit as the basis of the Indo-European languages, or even at the root of the Indo-Iranian languages. Sanskrit was never a spoken language. The word Sans-krit means "created by purification." It is a very rigid set of 4000 rules of grammar formalized by Panini of Afghanistan around 350 BCE. It assimilated practical terms from many ancient natural languages (the Prakrits) at the root of most of the current regional languages on the Indian subcontinent. The relationship is not much different than the evolution of modern English, with words borrowed from virtually all languages on the planet. Now it is making inroads toward wider acceptance in international communication, and is utilized even by those who do not use it in their daily life. Of course, English now has many more technical words.

Linguists ignore a very fundamental aspect of language that lies well beyond word etymology. Learning to manipulate symbols is key to training the mind without too much genetic tinkering. Such symbolic means are effective in communicating complex skills to the young. The gene complex involved in symbolic thought manipulation probably precedes the evolution of language ability. Syntax ability or its precursor is certainly associated with pattern recognition that underlies the complex skills needed from spotting prey to the weaving of nets and baskets. We still require adolescents to be proficient in relations of geometry and algebra, including ratios and fractions. Recursion with combinatorial skills is inherent in the recall of identifying relations one inside the other, as for successive approximation and midcourse correction in navigation. Use of recall and differentiation provides ways to organize and categorize on the basis of defined criteria and the search for context. Together, such

skills are necessary to look ahead and infer consequences before acting. Of course, such skills precede language, although the tools of language often facilitate transfer of skills and experience to develop cognitive tools. If choices are made on the basis of adopt or opt out, decisions must evaluate the costs and benefits to take risk and discount the future. Even conceptually, it is not easy to see how starting with the syntax ability and abstraction (i.e., ability to manipulate symbols) of cognized inputs it is possible to arrive at perceptions that underlie choices and decisions. Such givens of human nature are now increasingly intertwined with language ability. It is not clear what its relation was in the past.

Organized society evolved from and necessitated the ability of symbolic expression. Conventions based on symbols code knowledge to facilitate sharing. Language communication has played a major role in charting the course of human progress, so much so that now it is indispensable for survival in, as well as of, an organized society. Language unleashes reason. Shared thought provides a basis for validation that paves the way to store and recall experiences without face-to-face communication or confrontation. Like recalled facts, verified thoughts are a viable and reliable alternative to personal experience, just as reason is a preferred alternative to brawn and grunt for conflict resolution. In effect, language does what genes cannot do, at least not as rapidly. In the last few millennia, symbolic expression and communication has emerged from song and dance to accounting and mathematics based on elaborate modes of symbolic reasoning. Such skills fine-tune behaviors for socialization in real time. In fact, symbolic constructs can now be reliably transferred at electronic speed over astronomical distances (Berners-Lee 1999). Paradoxically such developments have also increased interdependence and

homogenization of preferences and choices. The content can be far more easily censored and manipulated by a few, creating a need for far stricter ethical standards than the moral codes of yesteryear.

To spread DNA and ideas in a complex society, individuals rely on intricacies of group behaviors that take advantage of available niches as they arise. Playfulness and language skills signal mental health. Playfulness obscures intentions until opportunity arises. Large social gatherings such as fairs and festivals provide opportunities to trade necessities and create new alliances, including potential mates tamed and domesticated by cultural rituals. For the individual, identity, curiosity, and fear are groomed with literature, music, and arts shared with peers. Myths evolve to provide a shared platform for a culture to base their practices and innovations (Campbell 1988). The taming effect of myths is not call for inaction or timidity against the unknown, but to weed out constructs of the nonexistent that are irrelevant in practice.

Myths are not religion, and vice versa. Most cultures have myths, and far fewer have religion. Like most people, Wade confuses myth with religion. Religions build on myths about the unknown, but religions are structured on a scaffold of nonexistent ideals and miracles. Myths evolve from the inconsistencies of a perceived unknown, whereas organized religions thrive on contradiction of the nonexistent. Religion, and certainly a God, is a relatively recent invention. In effect, Judeo-Christian-Islamic religions have taken away the tentative and personal nature of inspiration from shared constructs inherent in evolving myths. Followers of Yahweh turned myths into a delusion of faith and truth for the

chosen few (Dawkins 2006). In designing heaven and hell, they perpetuated quaint notions of omniscience (religion) backed by omnipotence (war). Besides providing legitimacy to fiefdoms, keepers of the higher purposes fuel their own ambition for greed and grab. History tells us that it has been a dangerous mix for nonbelievers. In the 20th century alone, we have witnessed unprecedented mass killings that are justified with sound bites and justified true beliefs of one brand or the other. Of course, true motives are obscured by intellectual-, social-, political-, or faith-based notions that seek advantage for the chosen few through devices of cunning. Although defeated, such notions and interpretations never seem to disappear. No matter what their initial purpose, without accountability and external reference. in the long run, all vices and institutions exist for their own good. Arguably, such notions are promoted by few freeloaders, rather than to weed out freeloaders, as Wade suggests is the purpose of religion.

Constructs of religion can hardly be called product of a fundamental human need. It does not even serve the need as expressed in myths. Faith-based paradigms are putatively constructed to deal with the unknown. Their nontransparent reasoning tools about a nonexistent entity legitimize and empower the chosen few. Others are doomed to live with the faith in something that they cannot even grasp, let alone understand and reason with. Emergence of organized religions parallels emergence of empires whose boundaries are determined by available technologies, such as horse, sword, guns, and now the mass media. Empowered by the "good and right" on their side, believers crusade and colonize in the guise of making right of the demons and barbarians. This template is still used to

mobilize resources and justify use of power against others. Such practices rob most to empower a few, as spins and rationalizations place most in a subservient role. Beliefs shape not only a homogenized social identity, but also what is acceptable to mind. Such constrained expressions make it abundantly clear that restraining instinctive impulses means a call for inaction. Here taming breeds traits of timidity. This cannot be evolutionarily good. Thought and shared knowledge move through foot soldiers with widest possible participation for diverse inputs because evolution is about coexistence to express the potential of most.

The phenomenon of faith-based behaviors is intriguing (Armstrong 1993). It is a common misperception that all cultures have religion. In fact, the very construct of Truth or God stifles reason, thought, inspiration, and imagination. Most cultures do rely on myths to explore here and beyond without resorting to ad hoc constructs. In lumping the unknown with contradiction of omniscience, reality is mixed with the nonexistent in a very self-referential way. It is like a magic bag in which anything can go in and anything can come out. Having an ethical, social, and personal code of conduct is not the same as the faith in something this unaccountable, unknowable, and nonexistent as is often the bases for the moral precepts. Imagined worlds are useful devices to explore ethical alternatives that must conform to the existent world. Language is the only way to share and validate constructs of what we see, experience, and feel. Relevance of such perceptions may be a matter of individual preference and choice. However, evaluation of their relevance for shared social utility must meet stricter criteria for validation. Constructs of shared knowledge are validated and established not just on the basis of

internal consistency or non-contradiction, but with positive external and independent evidence. (For related topics see www.hira-pub.org).

As a way to overcome limitations of language, slowly but surely shared human knowledge continues to help us cut through the chase of the nonexistent that is often contradictory, inconsistent, paradoxical, and self-referential. In epigenetic worlds (Jain 1999), language is indispensable for the formulation of thought and communication of experience as the basis for shared knowledge. Instincts may respond to awareness of momentary reality. However, tangible group behaviors require choices and decisions governed by perceptions built on tangible patterns. As we learn to differentiate the unknowns of tangible personal and social value, it is inevitable that elements of faith and personal beliefs will influence social choices. Detours are not uncommon. Controversies appear where there initially may be none, and issues appear muddier than what they might be otherwise. Our collective perception of usable reality has certainly improved such that in many spheres of life, most of us are able to make bounded rational choices. How to do better is a continuing challenge that is unlikely to be addressed through the biology of neural organization, even if the basis for thought and associated mechanisms is established.

The evolution of language communication distinguishes humans from the rest. Language-based reasoning is indispensable. Even if language may not have changed human behaviors or natures, it is an effective means for behavior modulation, if not modification. Although reason is not infallible, it is a far more efficient means to explore behavior alternatives. It offers better ways of winning

over others, and language communication takes the edge off expressions and does a better job of cajoling people. Effective use of language provides a wider dynamic range of capable measures for socialization and abstraction. Under nonthreatening conditions, languages facilitate a dialogue of cognized inputs and thought. Taming thought with reason is about reasoning with cognized reality that is necessary for accountability and consequence evaluation. Boundaries of reasoned thought provide a glimpse into unknown worlds, and rules out nonexistent worlds. Language communication facilitates sharing, precision, and quantitative and qualitative differentiation to reduce ambiguity. Having ascertained the facts of information, it is easier to explore their relevance and meaning through a shared quest under nonthreatening conditions. Reasoned discourse promotes nonviolent means of conflict resolution. A reasoned consequence evaluation helps in arriving at suitable corrective measures of altruism, trust, reciprocity, and deception.

Evolution is the story of success of survival, but it is not a dead end in the tree of relations. It is written a posteriori, and is justified with criteria pieced together for consistency. It is not an exercise of consequence evaluation from a priori. In the absence of brutal constraints, the number of possible outcomes gets out of hand (chaotic). As such the system is not amenable to closed analytical scrutiny because survivors tell little about what else happened, or could have happened even if the boundary conditions could be defined. Even if the criteria of success are not known a priori, it is useful to contemplate plausible scenarios for consequence evaluation. It can tell whether additional details are needed, and what remains to be examined and explored. Evolutionary, social, family, language, and historical insights

provide criteria and constraints to overcome limitations of the view from a single window. Inferred relations in a complex system rarely have binary outcome. Straightforward answers are unlikely for the questions that aspire to peek into the future on the basis of the past. Of course we can muse about: Is evolution in genes? Are genes pre-adopted? Is there a purpose? Are choices, decisions, and goals built into the random walk of mutation? If nothing else, at all major junctures in the history of human thought, such questions have helped us redefine our notions of our self and to nudge away from the pitfalls of the self-reference paradox.

The decoding of the genome is a seminal event that will continue to influence our perceptions of epigenetic worlds. Such perceptions guide thinking and understanding of the world around us for decision-making. They help us revise notions, including the very notion of self. Chemical sequences coded in genes have provided remarkable insights into the biological being that is coded in the genetic material. It is also a reality in that the "purpose" of a biological being ends after its genetic material is passed on. This evolutionary purpose defines the boundaries of population biology, yet it also provides insights into human natures and behaviors. *Before the Dawn* is certainly not the last word on the subject, nor is it about dawn of New Age. It is unlikely to appeal to anyone who is not swayed by facts, or those who seek meaning in the nonexistent or unknown, or are swayed by myths of perpetual meaning within assumed stability of faith. Reasoning through facts requires courage to sort out the wishful and imagined. If the meaning of acts and actions is a matter of interpretation of the facts of cognized reality, understanding their significance is the realm of the perceptions of the actor.

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III-36 There is No God: 100 Reasons

The following arguments may help you immunize your children against the humbug of nothing. It may also ward you from the proselytizers of nothing.

The following statements about conceptions of god invoke nothing else but "nothing."

1. Nobody has seen it.

2. Those who have communicated with one are in disagreement about what it is, what it does, where it is ….

3. There is no consistency in any particular representation of it.

4. There is no continuity in its purpose in a given culture.

5. Its descriptions in different cultures (places and times) are inconsistent.

6. It is invoked for cross-purposes

7. There is no agreement whether there is one or many.

8. "If it does not god then what else" is not an argument for its existence.

9. Consequences of its existence are not demonstrable or distinguishable from that of its non-existence.

10. If it existed in the past and it is not demonstrable now, all one can say is that it may have existed in the past.

11. If it happened once and never again, all one can say is that may or may not be so.

12. It may not have happened if the consequences of the past happening are not demonstrable.

11. How does an omniscient (know all) can not distinguish between the particulars at different places.

12. Computing power needed to take care of all the happenings in the universe can only be provided by its computing power would be greater than the number of atoms in the known universe.

13. Religiosity (a fallback on just in case type of god) correlates with poverty and corruption.

14. European history is a testament to the wars perpetuated by religions. Such dogma later took the form of colonialism and other hypes of moral superiority that continue to perpetuate armed conflicts.

15. Morality is about mores (customs and codes) of a tribe. Moral and legal codes allow you act without thinking. These are often invoked to shirk personal responsibility for unethical behaviors.

16. Our windows to the world are through physical chemical inputs to the senses. Therefore anything beyond sense experience is senseless humbug.

17. Sense experiences begin to imprint developing brain in the fetus and later to program mind onto the architecture of brain. A suitably programmed central nervous system interprets sense inputs as neuromuscular and neuroendocrine outputs to virtually all other organs.

18. Information processing functions of CNS of all organisms are shaped by sense inputs. Thus outputs and inputs for mind to mind communication between organisms should also be interpretable in terms of shared reality.

19. Reality is never contradictory. Therefore functions of mind programmed with reality based sense inputs and their processed outputs are also rooted in reality.

20. Words as the medium of mind to mind communication must describe real world behaviors. Descriptions that convey the content and context of a concern permit reasoning to build shared knowledge about the meaning and significance of the underlying sense experience.

21. Narratives of imagined worlds or those that evoke emotions communicate feeling. The experience as such may be shared but it

is hardly ever useful for reasoning. It is not to denigrate flights of imagination that foresee the future by offering a viable idea.

22. Anything that is beyond sense experience will remain beyond reasoning.

23. Narratives of imaginings may become gospel truths that sustain beliefs of faithful. However, assertions in streams of consciousness can neither be affirmed by independent evidence, nor do they provide a viable basis for reasoning.