IV-20   Deconstruction of ad hoc

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

- Samantbhadr ca. 200 CE.

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

- Nietzsche

Diversity of inputs and outcomes enhance quality of conception of complex worlds. Pursuits of knowledge to support decisions and problem solving are highly goal directed processes where a solution comes at the expense of everything else. Use of the logic of parts to deal with complex systems, where parts can not be identified and quantified, is a not meaningful, except the assumption that the known facts of reality can not be violated. Therefore, it is critical to examine the paradigm on which such models are based. Certain elements stand out.

Theory Mess. In the classificatory order of the Scholastics image of being rational is often cultivated by appearing to base arguments on what is commonly perceived as ordered, if not tried-and-true. Crouching arguments in some sort of validity of moment to justify beliefs is nowhere more insidious than in politics and religion. Excesses of *scientific creationism* or *intelligent life* are matched in a comment by the Chinese President Jiang in

1990s to justify imprisonment of dissidents as: *Theory of relativity,*
... , I believe can also be applied to the political field. Both democracy and
human rights are relative concept and not absolute and general.

Few hundred years earlier in one of the notorious cases
Sepulveda argued that the inhabitants of the New World are not
human. In the environment of the farcical inquisition trials, King
of Spain, predisposed to collecting gold, was swayed to order
destruction of flourishing cultures. Humanistic arguments were
ignored. Even today, the best of legal and political systems are
adversarial - meant to polarize the dialectic - often in the context
of the prevailing wind.

In humanities there is temptation to match the success of
science. The two cultures have been apart from the beginning and
an overlap is a dangerous mix. It is for the benefit of both if they
remain separate but communicate effectively. Instead of
mimicking science other disciplines can do what they do best. If
not swayed by ad hoc, humanists identify issues of human
condition. Philosophy is good at posing problems to explore this
and other worlds. Enduring philosophical questions do become
scientific problems as a part of the belief that universe as whole
and its parts are understandable. The problem of disaffection
emerges when as mere pretension we apply the understanding
provided by methods of science to beliefs, meaning, or social
engineering.

Beliefs are blueprints for inquiry and decision-making.
Acceptance of something as true is one thing, and the truth of that
belief is another. Documenting the former is a traditional
historical endeavor. Establishing the latter is a routine
epistemological task. Just as a philosophical quarrel is not a
psychological speculation, epistemological language is not
epistemological principles. As we affirm the constructs, it is

necessary to evaluate their origins and establish a deeper basis. Otherwise, we risk a contradiction and fallacy in the premises.

Reliability of constructs and representation in practice is often a useful measure of the connection to the underlying reality. Constructs of the world through laws are judged relative to the underlying reality, and the ability to predict outcomes is verified through practice. Through such abstract and expedient the laws of physics and chemistry have a truth-value. Justification lies not in the context of its origins but in the content and the evidence that is always available for reexamination. A dialectic cultural critique of science is not the same as the use of politically and ideologically charged metaphors in scientific discourse. The later reveals science as a construct of empirical practice as it tries to stay in touch with shared reality. Neither is to be confused with *scientificity*.

Metaphor of Science. Science is no substitute for rationality: It has been used far too often for deliberate irrational ends. Scientifically elaborate methods were used in the concentration camp, battlefield, and other operations for social engineering and salvation. Such factories may not be in public eye, but attracting public participation invites scrutiny of insidious manipulations in guises of official secrecy. There are far too many instances of ideas once thought to be democratic or universal are later exposed as alibis for social inequities for institutional-use.

Nuclear Waste

In Goiana (Brazil) a glowing substance was discovered in a piece of junk. The dealer showed it to his friends. The children were fascinated by it and dozen of them smeared it on their body. The authorities were alerted only when dozens of people died. They found that the material was cesium-137 isotope from a

machine for the radiation treatment of cancer patients.

If you think that this is an aberration from a third World country, consider the following: Plutonium is primarily used for the production of nuclear weapons. It is also the most toxic material known: inhaling a single molecule can mutate the genes and potentially kill a living being. To this add: *The 1992 meeting (organized by U. S. Department of Defense with armed guards posted outside the door) involved a report to the top brass on the current state of the art with regard to managing nuclear waste, some of which will continue to be dangerous for up to 240,000 years. "It was a very unusual meeting," she says, "because these engineers basically admitted that they didn't have a clue what to do about it. In fact, they were personally overwhelmed by the enormity of the problem. A couple of them actually broke down and sobbed."*

Things have not changed much since. We are in the early part of the learning curve about the consequences of Nuclear power plant technology that was created to address exponential demand for energy. All the nuclear waste has been created only in the last 50 years. The problem of nuclear waste for health and environment was not even suspected until 1960s. We do not know what to do with the extremely hazardous high level nuclear waste that comes from spent fuel and the operations of the fuel and arms production facilities, and everything else that comes in contact. These materials are likely to remain dangerously radioactive for tens of thousands to millions of years. The proposed solutions range from outlandish (hurling it into the outer space) to ridiculous (burying it deep in some mine shaft). Operationally, the issue is what should be done to confine the waste for at least 10,000 years - that is the time during which plutonium decays to the currently acceptable level. This is also the length of time that has passed since the last ice-age, and

virtually all human technologies have evolved during this time.

Expertise means not just having relevant experience and knowledge but having demonstrable competence and clear evidence to justify doing things, and not just in one way rather than another. In effect, we know the dangers of radioactive stockpile - not just as the weapons. We know that we do not know how to dispose of such dangers. Yet most nations continue to produce it, stockpile it, explode it, send it up in rockets, and some times even misplace it. Considering such limitations one may wonder how the problem is being handled now by the various nations equipped with nuclear arms and power plants.

Consider t*he technologically feasible solution* of burying the waste in the mountain range of Nevada. Advantages include: it is near the testing and production facilities for the US nuclear arsenal; the site is in possession of US government and far from most population centers; the arid climate is likely to minimize risk of seepage from the ground water; and the site is far from oceans in the event of the changes associated with the rise in the ocean levels in the event of global warming. One could even make a technological case for making the site earthquake proof - only if we know about the geological and physical behavior over such an extended period of time. One of the more serious problems comes from the fact that concentrated waste is likely to remain at a temperature of 200°C (450°F). Very little information is available about the properties of materials that will last for 10,000 years under such extreme conditions. US Department of Energy has concluded that climatic conditions resulting from another period of glaciations (ice-age) will be cold and dry.

An ancient wisdom observed: *From a hundred and twenty leagues a bird sees carrion far below, the very same bird is unable to recognize a trap.*

Some of science is concerned with improving human well-being. Often the consequences of scientific salvation are not as carefully thought through. Consider the measures based on the realization that happy and healthy individual is a better citizen. Now for the first time (since March 2001) in the human history a greater percentage of the human population consumes more calories than those consume less than the needed calories. Success of agricultural revolution has eliminated hunger for most, yet it has created conditions for malnutrition of another kind. Reasons for curbing obesity are emerging as we realize the personal and social costs of cancer, arthritis, diabetes and cardiovascular problems associated with such malnutrition.

Crouching science for the social purposes has prompted the warning: *Any mingling of knowledge with values is unlawful, forbidden*. Justification of science is in good science that establishes validity of the knowledge first. Applications and utility will and do emerge from such insights - some expected and but many more are unexpected. For good reason there is healthy dissent and opposition in the rank of practicing scientists for overt attempts to fashion instruments of social engineering. It follows from the realization that extracting consequential from the instrumental is never neat and clear in areas of human concerns.

No enterprise can transcend its origins or what is intrinsic in premises. With this in mind, effective divide-and-conquer strategies are multi-dimensional. The goal is not the zero-error rate, but an essential goal is not to be overcome by the unknown. Such goals include sustainable choices for health, happiness, and meaning. The *choice of meaning* is personal for all individuals. As for the *meaning of choices* in the real world: Stupidest means least selective in terms of choices or actions.

If nothing else, the role of knowledge and information is to reduce level of anxiety with which we all live with veritable Pandora's box of possible worlds. Unfortunately, there are no natural laws about what we should allow or disallow *a priori*. As for the patience, Max Planck observed: *A new scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die, and a new generation grows up that is familiar with it.*

It is the way it has been. Even if we believe in the survival of the fittest, we have to police against cheating, stealing, murder, prostitution, and worse. Problems are often ill defined and solutions are impregnated with prejudice and past practices. Some arguments are easy to falsify. Some persist through belief and faith even when contradictions can be spotted. Ideologies, theories and practices of the yester years are more difficult to rid. Such dead-end appeal to the timelessness of the meaningless: We are afraid to admit that *there is nothing there* like the Emperor's new clothes.

Through fads and fashions of convictions we cannot 'compute' or 'meditate' our way out of commonsense. Social and thought engineering through metaphors of science is misguided. Newton's laws and Darwin's principles prompted theories of social change that were used to justify war and exploitation. Logical deduction, and to some extent even the empirical and implicit inductions, tend to focus on what is already built in the assumptions behind the metaphors. While the analytical and logical methods spot the contradictions they suffer from the problem of incompleteness and undecidability built into the starting assumptions. Not surprisingly deeper concerns about methods of science have come from scientists themselves because they understand the origins of the problems long before they are

apparent to anybody else.

Metaphors are always imperfect: They free thought by interjecting assumptions. Even if metaphors have liberating influences on thought, it does not necessarily mean that they are enduring. Of course, the reality and meaning has to be built into the assumptions and axioms. Metaphors of social action do not handle reality in the same way as the metaphors of equations handle the reality. Equations are useful for modeling outcomes of defined worlds. Precision of mathematics is useful to check internal consistency. Using wrong mathematics leads to fictitious causes.

Room for Doubt