MACHINE, MYTH AND METAPHOR 1968

MACHINE, MYTH and METAPHOR 9 meetings (3 units) Fall Quarter 1973

Proposed Course Outline: Albert Wilson and Donna Wilson, Instructors

PART I: Bridges and Containers

Unifying and integrative schemata (e.g., the Scala Naturis)
The paradox of value in Science
The bridge of significance in Humanities
The container of energy in the Arts

PART II: Metaphors from Technology and Science

The Hologram as a new relation between Wholes/Parts
The Black Hole as entrance to other worlds
The Double Helix as a dynamic of change

PART III: New Myths for our Technological Experience

The emergent myth of the Moon Trip
The archetypes of the Bomb
The Virgin and the Dynamo revisited

MACHINE, MYTH AND METAPHOR

THE SEARCH FOR A WORLDVIEW FOR THE POST-INDUSTRIAL AGE. DEVELOPING BRIDGES BETWEEN THE "TWO CULTURES"--THE SCIENCES AND THE HUMANITIES. CONCEPTS FROM SCIENCE AND TECHNOLOGY AS TOOLS FOR THE SYNTHESIS OF NEW IMAGES OF MAN AND THE WORLD: HOLOGRAMS, BLACK HOLES, DOUBLE HELICES, ETC. AS METAPHORS. IDENTIFYING THE MYTHS AND ARCHETYPES THAT CONTAIN THE TECHNOLOGICAL EXPERIENCES OF OUR TIMES.

MACHINE, MYTH AND METAPHOR
(Everything you always wanted to know about stuff but were too confused to ask)

INTRODUCTION

It is a well known attribute of our culture that we like to store our experiences in boxes. Perhaps this is because physically we live in boxes and we can most easily adjust to housing our cultural experience in the same way we house our bodies. We give labels to these boxes in which we store our experience. Some are labeled:

Repeat--very pleasant
Repeat--get more data
Swap--very interesting
Teach--very important
Ignore--very confusing
Hide--very embarassing
Don't think about--very dangerous

Some experiences get in a curious combination of boxes:

Repeat (very pleasant) but hide (very embarassing).
Teach (very important) but don't think about (very dangerous).

This is all very subjective--it ties our boxes to our feelings. Perhaps if we didn't live in boxes we might not be so inclined to try to put our experience in boxes (the experience we choose to communicate by education) or our curricula into departments. But we use boxes in a second way: To differentiate, to discriminate is one of our most powerful cognitive capabilities--the basis of all organization. We need to preserve the results of our painstaking discriminations--hence, boxes. We pick labels--apples, oranges, balls, eggs--for the things we can differentiate. This is all very objective--it ties our boxes to our sensory/reasoning faculties.

It just happens that our experiences get two labels: One the subjective-feeling label:

pleasant,
interesting,
significant,
important,
useful,
dull,
exhausting
ennervating;

I've
good
beautiful

the other the objective-sensory label:

spherical,
heavy,
red,
slow,
hot.

The two labels are always present, but living in boxes we like to put these types of experiences into separate boxes, too. One box has to do with the objective things, to which we give the discriminatory description:

This box is called "sciences."

The other box has to do with our other labels. Our evaluations. The meanings we find. The significances we attach. The feelings that rise in us:

This box is called "the humanities."

There is a taboo in our times forbidding mixing the content of boxes. With all the work we have gone to in order to make differentiations, we would be throwing it all away to remix things.

I find myself supporting this taboo. I see no point in remixing the contents of the boxes. But I do see the importance of recognition that we have not been talking about the same kinds of boxes and we must begin to discriminate between types of

boxes and see that many objects can be in several of these boxes without being remixed.

A metaphor--boxes for categories--is useful as it enables us to perceive relations. But it is also a trap. The theme of this course is how to get out of boxes.

Since C.P.Snow's ~~admonitions~~ warning concerning the dangers inherent in the gap between the two cultures-- the Sciences and the Humanities, there has been increasing recognition of the urgency to integrate these great heritages. When we consider the fundamental attributes of each we wonder why there should be a gap at all:

- The central theme of the sciences has to do with representing and organizing our experience and--within the limitations of the mode of growth imposed by the methodologies of science--with the chosing of new experience. Poincaré (epitaxis)

  The central theme of the humanities has to do with an inexactly defined but all pervasive human endeavor that we may call "The Search". for self for meaning (includes Arts Religion)

- The directive of the sciences is toward knowledge and understanding.

  The directive of the humanities is toward wisdom and meaning.

- The dynamic of the sciences derives from the tensions created by two frontiers--one set by that which has been experienced, the other set by that which has been structured.

  The dynamic of the humanities derives from "The Other" whether it be beyond or within.

- The guide posts of the sciences are validity, accuracy and comprehensibility. predictability, simplicity

  The guide posts of the humanities are significance, satisfaction and energization. (establish)

The relation between two such cultures seems appropriately that of complementarity rather than that of rivalry. What then are the roots of the gap that is leading to cultural schizophrenia in Western Man?

In continuing the list of comparisons, some of the reasons for the gap begin to become visible:

- The values of science are fixed and rigid. These are objectivity, control and paradoxically valuelessness.

  The values of the humanities are open ended. Value is alterable and is itself an object of the Search.

- The methodologies of science are its dogma. That which is intractable by any of its methodologies is ignored or denied.

  The methodologies of the humanities are as many as there are men. Each act of reflection, evaluation and creation involves its own unique methodologies --methodologies that recognize no domain of No Trespass.

- The faith of science is in its own ultimate ability to subsume all experience, knowledge and activity into its structure. Cf "When we have advanced further we shall be able to explain all such phenomena as religion in terms of scientific principles such as those of behavioral psychology." But until all is subsumed it is reinforcing to the faith to adopt devices such as the positivistic discrediting of that which is not subsumable as being irrelevant or meaningless.

  The faith of the humanities is in the essence of Man. He is greater than any of his creations or constructs. When conscious of his multi-dimensionality, he is ever reminded that to become attached to either his failures or his successes is to cut himself off from his potentials.

See Churchman about Limitations of Science
I.S. p12,13
: p15, p18.

In contrast to the Greek ideal of Humanities utilizing Science and its factual findings in the process of seeking wisdom, we today find efforts to turn all of the humanities into a science. Social science seeks the objectivity of nuclear physics in its description and presceiption of social ills and political scinece assumes scientific 'value-free' models in its practice of the possible. The results are absurdities an outrage to our humanity and inner sense of value. In this course, we turn the issue around and instead of asking how every human experience can be forced into a science, we will ask how can we integrate every branch science into a humanity.

There may be several approaches we could follow. The two explored here will be the amplification of the new metaphors and images contributued from scinece and the identification of the new archetypes that emerge in its practice. While science is primarily concerned to discover laws of explanation, it inevitably introduces new metaphors such as 'black holes' as well as new techniques such as computers. Many have emphasized science's technological by-products; few have even mentioned science's metaphoric by-products. We suggest that despite the immediate fascination with how science provides us with new detergents, deodorents, and dishwashers; the durable fruits to be harvested from the practice of science are its metaphors.

The second approach follows Joseph Campbell's lead in seeking New Myths To Live By. He suggests that "surely it is folly to preach to children who will be riding rockets to the moon a morality and cosmology based on concepts of the Good Society and of man's place in nature that were coined before the harnessing of the horse." If so, what are the new images that determine our search for meaning today. The archetypes dictated by science are every bit as "real" as the hero archetype of another age. This course will identify our cultural self images and world views of the scientific age and outline the prevailing proverbs and maxims implied in the scientific method. There is no possibility of transforming or changing a culture without being informed of its contents and our time contains the dogma of science. Our first task in attempting to turn science into a humanity is to become aware of its metaphors and myths.

evaluate,
How do we integrate, internalize, digest, test our experiences?
How do we find meaning, energy, healing?

These subjects have little to do with present education, daytime or extension. But they should be the very basis of education and the educated person. The achievement of a self-sufficiency that is the prerequisite for every mature relationship and for membership in any community that is organic.

What does all this have to do with this course? This is the infrastructure for this course

This course is an experiment in the design of a curriculum on how to lead us each to where we know what to accept, reject, search for, ignore. And why we make the choices we do.

It is a science course, because the task of the science is the conversion of experience into knowledge, i.e., organizing of experiences.

It is a humanities course, because this is the task of the humanities--the conversion of knowledge through experience into wisdom.

It is an experiment because we are concerned with integration, and not much is known about how to integrate.

The theme of this course is basically the problem of getting out of the boxes. On a personal level, getting it all together. And when one says getting it together, it means into one head--yours, mine. It does not mean getting it into one library, getting it into one faculty, getting it into one committee, getting it into the back of one VW. Integration means getting it into one head.

This isn't easy. This does not mean to become an Aristotle or a Leonardo, in command of all known knowledge. It means performing all of the operations yourself. Setting up your own mill to grind your own experiences. To do your own choosing of what to experience, your own signification of what is important or relevant, your own digesting, validating, verifying, testing. Free from experts, anchormen commentators, editors, deans. This doesn't mean do what is meant by the expression "do what you want to do" which usually means being buffetted by the latest manipulation to which you have been subjected. It means developing a core of consciousness--without which you are easily manipulatable. It means developing a conscious image of you in the world as you are, as it is, and how you would see both become.

We must alternate between studying the world that is, the constraints (science), and creating what we can within that world (art). Art recognizes that it operates as freedom within constraint. Science is the search for the understanding of the constraints. Science also gives new ideas, concepts, because the constraints within which we work are themselves a larger creation, a larger piece of art. There may be many levels.

The alliance of science and technology is misleading: Technology has come to supplant art as the creative element.

12 May 1973

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12 May 1973

METAPHORS FROM SCIENCE AND TECHNOLOGY

Metaphor is the bridge between the three great branches of knowledge: The humanities, the sciences and the arts. Through metaphor we build out from our experiential base. Metaphor is the relational fabric that enables us to comprehend the new in terms of the already known. The "likeness" or analogiess between things that are basically different provide our entranceway to them. The root of understanding is relating to the familiar to the already understood. The framework of similarity must first be built before we can explore the infinite webs of diversity. Metaphor is one our most powerful tools in building this frameqwork.

Our experiential base can be measured by the number of metaphors available to us. To increase one's stock of metaphors is to increase ones power to understand. Yet there seem to be points at which metaphor fails. The experience of electricity, for example, cannot be adequately described in terms of the already familiar. It must itself be experienced directly toadd to the experiential base. Thus there are two ways of adding to our experiential base, the direct way through new experience and the exploratory way of groping through the use of metaphor. Metaphor provides us with a first approximation to the grasping of the new. The basic similarities that exist between all the things and events of the universe can only be taken advantage of by metaphor. (But this is an epitactic path)

The source of most of our metaphors is common sence--doxa--. The stockpile of metaphors that we have available is what allows us to encounter the new.

One of the most important sources of new and powerful metaphors is science and technology. In fact it may well be athat in time the greatest usefulnes of science will be recognized as being a source of metaphorsrather than a source of new gimmicks and products. (w Bacon) The power of these metaphors is what really distinguishes a scientist from a non scientist. These intellectual tools put those who understand them at a distinct advantage over those that do not. --whether one is a scientist or not. It is the ability to use metaphors that is the real power of intelligence. The knowledge of a concept is not enough, it is the ability to use this concept as a metaphor that is the essence of the command of the concept.

Take the example of the concept of "short circuit" which comes to us from technology. To be able to say we can short circuit this material conveys a method of behavior as well as an idea. The same with the metaphor, "dead center". It allows us to start up frequently when the problems are more severe than the metaphor conveys. Thus the metaphor gives us leverage.

... humanities are the synthesizers - bridges - ... antedote to specialization

Scientist possess powerful metaphors & concepts

Concepts + Metaphors from Science and Technology

From Mathematics

Special Curves + Shapes, S-curve helices, ...
Projective vs Metric
Duality, Fourier Transforms
Random, Probability
Gödel's Theorem
Russell's Paradox and others
Russell, Cretan, Barber, Grue-Bleen, Black Ravens
Theory of Types
Groups

From Physics

Laws of Thermodynamics
Entropy,
Conservation
Invariance
Optimization
resonance
Quantum Mechanics
Indeterminancy
• Critical Mass
relativity

From Biology

Cloning
Evolution
Emergence
Genotype - Phenotype (see M.C. 28-3 p13
Meiosis Mitosis
DNA - RNA - Double Helix
Bio-rhythms

Anesthesia

From Systems Theory

Feedback + and -, IOD
• Black Box
Hierarchy, Levels
Synergy
information
Dialectical Process

From Technology

• Short Circuit
• Dead Center
Holograms (Mirage)
Clock
Computer Technology
Hamming Distance
Binary
Hardware + Software
Storage
Types
Address - Content
Bootstrapping

From Astronomy

Black Hole
Cycle - wax + wane
Olbers Paradox (Unification)

Misc.

Recipe vs Blueprint (Ulam)
The "Stick Screen"
The "wet thumb" for getting the [illegible]

5.7 Science as Metaphor

In our brief sketch of imagination, we have suggested several times in various ways that human efforts to know are ultimately tied to who we as knowers are, how we perceive and organize what we know as well as what is knowable. These issues are epistemological and the new key to epistemology is that symbols are used both to attain as well as to organize knowledge. (56) Before this insight, sense data were considered primary in human cognition and their collection and measurement permeated every phase of epistemological investigation. The human mind was conceived purely as a recording and combining device and the central nervous system was metaphorically presented as a giant sswitchboard. Susanne Langer has done much to correct this inadequate image of mind despite the persistence of reductionists such as Wooldrige (57) and other advocates of artificial intelligence. But the old metaphor of central switchboard is not easily dislodged especially in lieu of an adequate one. At root, the reductionist-holistic argument that currently prevails in the effort to model living organisms is a matter of an adequate image of man. In spite of the fact we can observe the change in the metaphoric containers of man throughout history (for example, rational man of the enlightenment replaced moral man of the middle ages and today self-actualizing man is replacing economic man or organization man of industrialism), we cannot describe in any precise detail how metaphors fail or their replacements emerge. We may say that paradoxes of experience reveal inadequate metaphors and this is the stage we find ourselves in today. But answers to finding adequate metaphors are very much like the dilemma of forgetting what one was searching for until finding it causes one to remember what it was. We don't know what the adequate metaphor of man is until we find it. This brings us back to our central theme of change because we do know that metaphors mediate change.

We may turn to the history of science for an illustration of this mediation. While science is primarily concerned to discover laws of explanation, it introduces new metaphors as well as new technologies. Much has been said about science's technological by-products; very little about is metaphoric ones. We suggest that even though the immediate fascination is with how science provides us with new detergents, deodorants, and dentures, the more durable fruits to be harvested from the practice of science are its metaphors. If so, science is not as alienated as supposed by those who isolate it from the creative endeavor of poets and other makers of meaning and the current anti-scientific attitude might well be corrected toward its real enemy -- the failure to utilize imagination-- rather than toward its supposed enemy -- scientific discovery.

To recognize science as the maker of metaphors requires we utilize its language on a different level than the I/It level of transmitting information about the world. It also requires we become conscious of how we participate in our perceptions of the world. Failure to recognize our participation in our models of explanation lead to the simplistic and 'nothing but' reductionism that invite critics of science to suggest doing away with all science and defenders of science to insist that anything but science is illusion. The higher level view is both subtle and difficult to maintain. Mumford points out that "among the most original and fruitful contributions to the study of living organisms in the seventeenth century were Harvey's observations on the circulation of the blood, whereby he described the heart as a pump with pipes called veins and arteries, whose blood flow was regulated by valves; while Borelli made similar efforts to interpret the location of animals in equally mechanical terms. Both were admirable contributions, as long as their descriptive limitations were not taken as those of the living organism itself; for life was the 'filterable virus' that teasingly escaped through the pores of these new mechanical

containers."(24) Descriptive limitations is the clue for conscious participation; otherwise we fall into the trap of making idols of our mental constructs.(9) Langer also acknowledges the value of scientific metaphors. In commenting on the benefits of information theory as a metaphoric container of the mind she says: "that communications systems furnish models of some highly important neural mechanisms is demonstrated by the advances they have implemented in the field of brain physiology and neurology; especially the basic recognition that nervous activity involves electrical potential and current. The insidious influence of the model, however, is the apparent implication 'that the central nervous system is a communication system.' The central nervous system effects communication in the course of its total operation ... but radically different from that of a machine dedicated to communication as its primary function." (15)
We are thus forewarned that metaphors developed in one area and applied in another can lead to dangerous idolatry and insidious imagery. But transfers are made in spite of the misuses as the following list suggests:

the clock preceed the geocentric model of the solar system;
the waterpump preceeded the discovery of blood circulation;
the steam engine preceeded the laws of thermodynamics;
gambling preceeded probability theory;
war games preceeded gam theory;
refineries preceeded cybernetics; and
the solar system model preceeded the Bohr atom.

Other examples could be added. Our reason for pinpointing these metaphoric precursors of theoretical advance is to clarify the process of scientific discovery. Science continually remakes its grasp of reality through adopting new metaphors. It is an endless process of metaphor transforming itself into meaning. Hang-ups occur when metaphors become idols and

Max Planck's remark that old metaphors never die, only their ~~opponents~~ proponents confirms that idols exist in science.(58) The only way to overcome this kind of dogma is through the continual exercise of critical reflection of our primary orientation and worldview. A critical examination of our praxis by which we transform the world and create culture as well as history is one of the chief functions of an educated imagination. This transformation is an essential difference between human experience and animal or robot experience. Humans transform their world and reflect on their action. Neither animals nor automatons have a praxis resulting in both a culture and a history. The curious paradox is that science whose very mode of being depends on the search for and discovery of new metaphors to mediate its changing perception of reality should have ever been considered a paradigm for absolute truth. But despite popular and professional misconceptions of what science is and what it is not, our emphasis here is that metaphor leads to meaning. Recalling the above list of precursors, we may ask: what is it that follows the computer or the holograph? Those who can engage their imaginations will lead us on to a new image of life -- images to replace the inadequate images of reason, economics, organization, or even self-actualization.

The Part in the Whole (10)

PSYCHOLOGY TODAY, September 1971 The BRAIN by Karl H. Pribram.
p.48 Vol 5 #4

Holography is a kind of photography or in more sophisticated terminology, an optical information-processing mechanism. But holography differs radically from normal photography. In a regular camera the film records the intensity of light that is reflected from objects. Each point on the film stores information from a single corresponding point in the photographed scene. The resulting picture looks like the original scene. In holography, light from every point in the scene is distributed (diffused) to many points in the film. When the film is developed, no visible pictures or images appear. Instead the film has a pattern of tiny and larger swirls, interference patterns that look like a piece of moiré silk.

Further, the image from a hologram has true three-dimensional perspective. By moving his head, a viewer can look around and behind objects in the picture, just as if he were looking at a real scene from different positions.

The holographic film can be cut into fragments and each fragment when it is illuminated, will produce the entire image. Damage to any part of the film—even a large part—will not visibly degrade the image reconstructed from the remainder. Tear an ordinary photograph ~~of your family~~ in half and half the image disappears. Do this to a hologram and recognition remains unimpaired.

In addition, the hologram has a fantastic capability to retrievably store information. Many different interference patterns can be super-imposed in one hologram. Some 10 billion bits of information have been stored holographically in one cubic centimeter!

"The Whole: Counterfeit and Authentic" by Henri Bortoft
Systematics 9, #2, Sept 71 pp 43-73

1.1 *The Optical Hologram*

The advent of the laser has made possible the practical development of a radically different kind of photography. The "hologram" is the name given to the special kind of photographic plate which can be produced with the highly coherent light of a laser ~~(i.e. light which holds together and does not disperse—like a pure tone compared to noise)~~. Whereas the ordinary photographic plate records and reproduces a flat image of an illuminated object, the hologram does not record an image of the object being photographed but provides an optical reconstruction of the original object. When the hologram plate itself is illuminated with the coherent light from the laser with which it was produced, the optical effect is exactly as if the original object were being observed. What is seen is to all optical appearances the original object itself in full three-dimensional form, being displaced in apparent position when seen from different perspectives (the parallax effect) in the same way as the original object.

A hologram has several remarkable properties, in addition to those related to the three-dimensional nature of the optical reconstruction which it permits. The particular property which is of direct concern here is the pervasiveness of the whole optical object throughout the plate. If the hologram plate is broken into fragments and one fragment is illuminated, then it is found that the same three-dimensional optical reconstruction of the original object is produced. There is nothing missing, the only difference is that the reconstruction is less well-defined. The entire original object can be optically reconstructed from any fragment of the original hologram, but as the fragments get smaller and smaller the resolution deteriorates until the reconstruction becomes so blotchy and ill-defined as to become unrecognizable.

This property of the hologram is in striking contrast to the ordinary image-recording photographic plate. If this type of plate is broken and a fragment illuminated, the image reproduced will be that recorded on the fragment and no more. With orthodox photography the image fragments with the plate; with holography the structure of the reconstruction but not the clarity of definition is undivided with the fragments.

Myth/Math/Metap.

Lecture #2 on Worldviews

On World Views

A central goal of this ~~[illegible]~~ course is to create awareness of the structure of our cultural world images – Weltanschauungs and Cosmologies. These are with us like the air and light in the room affecting our behavior and necessary for our existence – but they are largely invisible to us and, like the light and air, are unheeded and unexamined by us. They are neither challenged nor approved – just there. But they are not subject to personal choice – except the option – love it or leave it. You may have your personal cosmology – but you must either split or give it up. This is because worldviews are collective – they are culturally – not individually based.

Only generally true

Minor local or national differences make us aware of the existence of a worldview – just as a change in the illumination or temperature makes us aware of the light and air in the room. Therefore to bring worldviews into awareness – we must try to change our feeling about the world – try to see the world as primitive man, classical Greek, Medieval man, Rennaissance man, enlightenment man, as well as modern man. We may attempt to do this by placing in juxtaposition various historical world views – and like in traveling ~~get the~~ become aware of difference that we did not know existed. And since we live at a peculiar limit point of history – a rare time in which the world view is undergoing change – we may look at emerging contending contemporary candidates to replace the scientific worldview which is now moving toward some sort of Götterdämmerung.

All public policy decisions necessarily embody some view (or compromise of views) of man in the world. The kind of educational systems and educational goals a society sets up, the ways in which it approaches the problems of material distribution (poverty and wealth), how it treats the welfare of its citizens, the priorities it gives to various human needs--all these aspects and many more are affected by the image of man that dominates the society. In a very real way, all policy issues are issues relating to fundamental assumptions about the nature of man and his concerns:

- If man sees himself as separate from or superior to nature, then an exploitation ethic can be fostered more easily.
- If man sees himself as a part of or one with nature, then an ecological ethic can be fostered more easily.
- If man is viewed as an animated machine of physical parts, then non-physical aspects of his existence are likely to be ignored, or denied e.g., in medicine, conditions of employment, architecture.
- If man is viewed as spiritual rather than physical, then material aspects of his existence are likely to be ignored, e.g., in public health, employment opportunities, housing.
- If man's nature is seen as complete and fixed, then his task is to adapt himself and his institutions to that nature.
- If man's nature is seen as continuing to evolve, then his task is to understand the nature of that evolution and to design his institutions to enhance that development.

Current Relevance of Man's Images

our beliefs and images elect to reality (1982)

While it is obviously important that our underlying images and beliefs be good maps of the reality in which we live, we probably do well not to pay them overmuch attention as long as the continuing welfare of society and its citizens seems secure. But as Chapter II shows, many of our present images may well have become dangerously obsolescent. An image may be appropriate for one phase of a developing society, but once

WORK SHEET
FORM 30-103- REV 1-431

← Mythic	600 B.C. HIERARCHIC	1500 A.D. MECHANISTIC	1900 ATOMISTIC	1960 ORGANIC	PRESENT TRANSITIONAL (If low sheet Chart)	AQUARIAN Th
Root Metaphor	God	The Machine	Dice	Computer Organism	Permit all previous metaphors; Hopi, Teilhard	
The Dynamics of Change	Telos (Aquinas)	Determinism (LaPlace)	Chance (Russell)	Integration & (Jung) coordination (Maslow)	Game	
Nature of Man	Moralistic Man	Rational Man	Positivistic Man	Self Actualizing Man	simultaneous existence on Many levels	
Nature of Universe	Apex Dominated multi level - top down	One Level	Two Level / Micro - Macro bottom up quantum	Multi Level / bottom up (reductionist)	meta-hierarchy / multi-level	
Parts & Wholes	W > P W ⇒ P	W = ΣP P ⇒ W	W = ΣP P ⇒ W	W > ΣP W ⇔ P	Metaprinciple ⇒ [W ⇔ P]	Temporal problems may invent direction of vector
Model of Change	No Change (Parmenides)	Rearrangement of Particles	2° Law of Thermodynamics	Emergence of Novelty	Intentional Evolution	
Source of Values	Apex - God	No Values - Amoral	Empiricism	Reverence for Life		
Source of Authority	The Apex - Revelation - God	Might, Power	The Statistical Norm	Self	∅ authority	
Authority	The Dogma (Aristotle) of Fact	The Dogma (Bacon Locke) of Method	Communities Concensus Agreement on method	Custom	← Diffusion of Authority	
Source of Hypothesis	Revelation	Empiricism	Experiment & Theory	Intuition	Bought from the Lunatics	
Nature of Truth	Absolute / Binary	Relative Truth	Relative Truth	That which is economic useful, elegant, simple, efficient		
Tests of Validity	Conformance to higher Principle	correspondence with fact	Rational / Consistency	Predictive Power	Inner satisfaction	
Nature of Model	Anthropocentric	classical: laws of motion, initial & boundary conditions	Quantum Mechanics Probability, Probability Field	General Axiomatic (self consistent)		
View of Processes Shaping the Future	Fate Telos	Deterministic Laws of Nature	Statistical Laws of Nature	Combinations		

WORK SHEET

FORM 30-103-[illegible] REV 1-431

Yellow Sheet Chart

p.2.

	HIERARCHIC	MECHANISTIC	ATOMISTIC	ORGANIC	PRESENT ~~TRANSITIONAL~~	AQUARIAN
LOGIC	Aristotelean Syllogisms	Induction/Deduction	Symbolic Logic	- Logics SPQ Statements	Paradigmatic Inference Self consistency, complexity of problem	
SPACE	Intrinsic Structure e.g. Polyhedra	Cartesian-Euclidean Absolute	Non-Euclidean		Liebnizian, Hamming, Morphological	
TIME	instantaneity	Derived from motion Newtonian Linear Absolute	Relativistic	Space/Time Biological clocks	Time is a property of matter (Hydrogen Clock)	
LIMITS						
Interaction of Model with Man						
Feedback	adequate	adequate	rapid change leads to IOO	[illegible] boiling & radioactivity		
anxiety	superstition/magic	heaven/Hell				
Projection of Evil	SATAN	Good Guys/Bad Guys	Other ideologies ~~Shadow~~, Differences	Shadow on the Page		
Access to Symbols	Priests	Educated Elite	Scientists	Self Actualized Man		
Political Manifestation	Oligarchy	Democracy	Bureaucracy			
The Unique Event	Hand of God ~~[illegible]~~ intervened	-denied-	coincidence improbable Fluke	peak Experience Synchronicity	The controlled unconscious	

HOW A MAN OF THAT AGE MIGHT DESCRIBE HIS VIEW OF THE WORLD

I *THE AGE OF PRIMITIVE REALISM* *From ? B.C. to 650 B.C.*	"We are two, the world and me. The world is just as I sense it (see it, touch it, taste it, smell it, hear it). The world is like me. In me there is a spirit; in the world as a whole, and in each part of the world that I deal with, there are spirits who rule. I have come to terms with these spirits. I do so by rituals, by magic. *The superior man is the magician or witch doctor who knows the spirits and how to deal with them.*" (In many parts of the world today, in all cultures and societies, there are still people who believe that there are "spirits" whose help can be invoked, or whose wrath avoided, through incantation of magic words and the performance of rituals.)	*"The world is what I feel it to be."*
II *THE AGE OF REASON* *From 650 B.C. to 350 B.C.*	FROM THALES THROUGH ARISTOTLE ✤ "We are now three: the world, I, facing the world, and I, observing myself looking at the world. To put order into the world, I classify things, qualities and actions in the world and in me. I take this classification into account when I want to guide my behavior. My ideal is to be as 'objective' as possible. My thinking must be orderly, as the world is orderly. My brain mirrors the world; to each thought corresponds a fact; to each word corresponds a thing, a person, an action or a quality. If my thinking goes from one thought to another according to logic, it directs me through the world from one fact to the next. *Within my brain there is a miniature of the universe.*" (Even after 2,000 years, there are still many people who think this way today. They are the 'practical' people; they accumulate 'facts' and pin labels on them, and base their conduct—and their appraisal of others—on 'facts' and labels.)	*"The world is what I say it is."*
III *THE AGE OF SCIENCE* *rom 1500 A.D. to 1900 A.D.*	FROM COPERNICUS TO PLANCK ✤ "I do not confer with the spirits as did the primitive. Nor do I deceive myself as did the Metaphysician (II) who mistook his own voice for that of Nature. I ask Nature definite questions and Nature gives me clear-cut answers. I translate these answers into mathematical formulas that project my conclusions into the unknown, where I discover other facts that Nature has kept hidden since the beginning. *The superior man is the experimenter-mathematician, the man who expresses relations in formulas that reveal how the properties and the actions of men and things follow measurable sequences.*" (The man of affairs today; the one who runs business and industry, serves in high governmental posts; writes and edits our journals and newspapers, is the product of colleges and universities whose curriculum is largely based on the experimenter-mathematician concept; he speaks in charts and graphs and figures, and bases his conduct upon them and his appraisal of others on the extent that they do so.)	*"The world is an immense machine and I can discover how it works."*
IV *THE AGE OF RELATIVISM* *rom 1900 A.D. through 1966 A.D.*	FROM ROENTGEN THROUGH RUSSEL ✤ "I find that the further I ask questions, the less and less the world seems like a giant machine. I have trouble even asking the 'right' questions and the answers frequently baffle me. Even when I ask the 'right' questions and get the 'right' answers, I find that the answers are in terms of my frame of reference to the world I have *myself* created through centuries of observations. The structure of my world is built of *my own* postulates, which must be re-examined relentlessly. They appear to be relative to my own space-time relationship with the cosmos, and with every unique event that I single out for study. What the primitivists thought of as spirits in nature, and the philosophers considered the 'facts' of nature, and the rationalists considered the 'laws' of nature, I find now to be but gross irregularities in the world as I see it through my inadequate senses and instruments. The only 'laws of nature' I can discover are statistical averages that provide rough indications of probabilities."	*"The world consists of probabilities that I create by my way of looking at them."*
V *THE AGE OF UNITY* *rom 1966 A.D. to ? A.D.*	FROM PEIRCE THROUGH EINSTEIN AND REISER TO? "Having discovered that I cannot separate what I observe from my own act of observation, I begin to study my own way of observing. When I do this, I find that my observation does not consist solely of what goes on in my brain, but that my total organism, with all of its history, is also engaged. "I discover that my most clever formulations take their origin and their significance from an immediacy of felt contact, of fusion and oneness with what is going on, beyond the dimensional limits of symbols, and without the distinction between the self and the non-self. Out of this knowledge comes an awareness of my inter-relatedness with everything, from blind cosmic energy to fellow human beings; the old, verbal distinctions between art and science and religion disappear—becoming an overall oneness of experience." (This concept, which after 2,000 years offers the promise that the powerful ethical systems of Christ, Buddha and Mohammed may fuse with the relativistic world of Einstein, the cyclic, recreative universe of Hoyle, the "participative iconology" of McLuhan and Ellul, is a still, small voice in our world of today. It can be heard in the enclaves of a handful of universities; in the words of a bearded poet somewhere east of midnight; and in the voiceless contemplation of a Zen disciple beside the dripping water and stone pools somewhere west of a Shoji screen. But it *can* be heard.)	*"My world has a structure that no formulation can encompass; I conceive of the world as my own total experience with it, and I play with my own symbolic constructs in a spirit of easy detachment."*

EXPLODING GALAXIES, DRIFTING CONTINENTS, DYING SUNS, GIANT MOLECULES, ATTACKING VIRUSES, BLACK HOLES, CONSPIRING GENETIC CODES, WHITE DRAWFS, GREEN REVOLUTIONS, ORANGE MOON ROCKS, RED TIDES, EXPANDED CONSCIOUSNESSES, COLLASPSING MATTER, POPULATION BOMBS, SKINNER BOXES.

Space Ship Earth

What does it mean?

What am I supposed to do with it?

Will it go away?

Should I ignore it? Should I try to get on top of it?

Can I use it? Should I support it? Should I oppose it?

Is anyone in charge of it? Does anyone understand it?

Will it hurt? Will it heal?

We are confronted not only with increasing rates of scientific discovery and accumulating gluts of technological innovation, we are all but inudated with new images and metaphors in the explanations announcing their arrival. Introduced inadvertantly in the search for explanation, the makers of metaphor in science no more evaluate their metaphoric byproducts than do they worry about their technological and social by products. But metaphors mediate meaning and the ability to assimilate the experiences of the scientific age depends on our ability to use its metaphors and understand its myths. This series of lectures identifies and explores metaphors from science and demonstrates the power of these metaphors to help expand our ability to think about collective and individual human situations. It will interest professionals, teachers, students, artists, businessmen and everyone concerned with the dominant trends of our time. It will even interest engineers and scientist seeking a fresh and more human perspective of their own innovations.

The Four Faces of the Future

Albert Wilson and Donna Wilson

Deep in undefoliated depths of a Cambodian jungle, ignored by ephemeral armies in their exchange of death and destruction, stand silent stone images of the Gods of Creation. Defying centuries of vandalism by sky, jungle and man, the four faced images of the ***Creator of Endless Tomorrows*** *look down timelessly on the ancient temples of Ankor Thom. Erected in the capitol of a once great empire, these symbols in stone are a constant reminder of the cosmic forces that inexorably govern the affairs of men, empires and planets; forces that were called into being by the Creator, to be obeyed henceforth through all time by creature and Creator alike; forces that underlie the ever recurring cycle of the materializing, dissolving and diffusing of worlds; forces that simultaneously free and fix the future; forces that must clearly be understood by anyone who would participate in the definition of "tomorrows." This great empire no longer stands. Only its monuments to the Cosmos survive. Its legacies for those who follow are the four faced images in stone; its legacies for those who comprehend are the Four Faces that create the future.*

Most of us associate the future with the concept of prediction—and our time is rich with predictions of what this world will be like in the future. Perhaps because our time has personally experienced such devastating increases in the rate, power and number of such things as energy consumption, weapons, changes in life style and mores, we who live in the last decades of the twentieth century are particularly sensitive to predictions about the future, especially the *near* future. Daily we are confronted with itemized inventories of what we will eat, where we will live, how we will work, play, learn, procreate, and die in the year 2000, 2001, or 2020. We are promised regeneration of livers, direct transfer of knowledge into our brains, foods synthesized from coal, petroleum or almost anything else, genetic specification of progeny as well as unmanageable population densities, worldwide famines, extransensory conditioning, global ecological catastrophies, and, provided we don't trigger a nuclear holocaust, any number of other horrors. The turn-of-the-century is twenty seven years away and another explanation of our current fascination with the future is that *millenia* stimulate mankind's deepest hopes or fears. For example, historians tell us that the decades preceeding the year 1000 also had their apocalyptic predictions, yet once the pages of the calendar turned to the eleventh century, the human race settled down once more and went about doing whatever it was it had been doing before the *millenium*. The prophets of doom and gloom died along with their utopian opposites and both took their unfulfilled predictions with them to the grave.

Today the most prevalent form of forecast is trend extrapolation based on a causalism that, excluding accidental or random events, determines what *is to be* entirely from what *has been.* It perceives change to be the sum of the pushes from the past plus the forces exerted in the present. For example, it is said that "We are consuming energy at the rate of 2 billion tons of fossil fuel per month and wood at the rate of 35 billion board feet per year; given the estimated reserves on the whole planet and the population based on the adjusted annual rate of 1.8 percent, and taking into account the new technology that will optimize the extraction of oil and the regeneration of forests, and also the promise of synthetic products that will be substituted for oil and trees; we now estimate that by the year 2033.47 there will be no more fossil fuel or trees." What makes such predictions so tedious is not that they are inaccurate or miscalculated, but that they are so unimaginative. They are merely causal and determinative. Causality of course is the traditional cornerstone of science, so it is not surprising to find futurists in an age dominated by science basing their projections on brute determinism.

But when we turn to the intuitive futurists who always focus on the possibilities in any situation, we find predictions of another kind. Here the world-to-come will be full of "synergistic systems"—enhancing human capacities to love, cooperate, and play while machines do the drudgery. The new game is the "world game" for all to participate in because "information is the new wealth" and allows us to "do more with less." Admittedly, a few details need to be filled in, but with the technology at hand or just around the corner, we will see "the greening of the earth." Astronauts of the year 2001 will no longer see a little blue globe floating alone in a vast background of black; "it will be green." We will have solved the garbage problems with more, not less, technology and the human problems with more, not less, conditioning and so go on to realize our manifest destiny. It is futile, one is told, to regret the invention of the wheel or the computer or any other man-made artifact. We need only leap ahead like the small bird breaking out of its shell at the very moment it has eaten the last bite of nutriment inside the shell and fly off into the future. The future is pregnant with possibility despite the "sensation types" who keep demanding to know, *Will it work.* To say the least, these images of the future are not dull. But they are also not exactly credible. They provide no inkling of how we are to go from here to there and since most of us are not especially adept in empathizing with the little bird, they somehow fail to grab us. With the same ennui that settled over the earth after the climactic moment when Neil Armstrong stepped down onto the surface of the Moon, our collective response to his "giant step for all mankind" is either a jaded, *So What,* or a cynical, *Oh Yeah.* Given the choice of Paul Erhlich's gloom and doom, Herman Kahn's surprise free scenarios of bigger and faster versions of today, or Alvin Toffler's shocks of what has already come to pass, many of us would choose Buckminster Fuller's optimism. But the determinative predictions of the logical "thinking types" and the speculations of the free-wheeling "intuitive types" are not the only Faces of the future competing for our attention. Obsession with prediction is not the only form of concern for the future.

Complementing the extrapolated judgments of the "thinking types" are the "feeling type" judgments of what is valuable and meaningful. This concern with the future stems from deeper longings to know what *should* be. Until recently, when the decision to develop the supersonic transport was questioned on the grounds of whether or not it makes sense to do everything we *can* do, technical feasibility and economic expediency have been the overriding criteria for deciding what we *will* do. Since the decision to delay the SST, we find a *normative*—that is, preferred or prescribed—element increasingly influencing technological and social forecasts. Here futurists depart from their traditional upbringing in scientific disciplines, for science has long prided itself on the avoidance of value judgments. In both feeling and thinking type judgments of the future, however, change is conceived as a result of forces exerted along the line of time joining past, present and future. In the case of trend extrapolations, the future is viewed by a Face that looks to the past, while normative forecasts view the future by looking forwards toward desired goals. Intuitive perceptions of possibilities contrast with "sensation type" perceptions of what will or will not work. Both assume change to be operating outside the line of time. For the sensation type, "time is now, in depth; and action is the only appropriate response"... for the intuitive type, "the future is all, what *will* happen is more real that what *is* happening." We have borrowed from Jung's four psychological types to display different views of the future because each type emphasizes one part of the whole. The fact that any one of the four is not sufficient in itself was the reason Jung introduced the notion of types. It is also ours. The predictions that the world is soon to end are but partial views of the future based on determinative models.

If we are to escape the past viewing determinism of trends, we need not only to employ the Face that looks forwards, the finalistic Face of purpose; but also the Face that faces outwards preparing us to receive new images and to invoke new incarnations; and the Face that faces inwards to internalize and digest our experience. To uncover the Face that looks forwards is to introduce vision and value. To uncover the Face that looks outwards is to introduce imagination and innovation. To uncover the Face that looks inwards is to introduce assimilation and correction. Our escape from determinism requires a *discontinuity,* and in contrast to the present worldview that sees discontinuities as a major source of failure in the ability to predict, we ask where, how and why do discontinuities occur. Discontinuities that are powerful enough to break the course of a stable path, such as a cultural pattern or a life style, usually follow some natural catastrophe—an earthquake, flood or famine; or some human catastrophe—a war, revolution or depression. On the individual level, discontinuities are the events dividing our lives into periods of "before" and "after"—before we moved to California, after mother died, before the baby was born. Discontinuities generate anniversaries and the celebration of anniversaries is a primary process by which humans assimilate change. Occasionally discontinuities that upset the [redacted] state of a culture or an individual [redacted] from our point of view, positive—a divine child is born, a new world is discovered, or a conflict is resolved. The ability to discover alternative images of the future powerful enough to transcend determinative trends is proportional to our ability to imagine The Other. So long as we engage our imaginations in merely performing permutations on what is known rather than in encountering the unknown, the determinism of our present condition will continue to imprison us.

Discontinuities also occur through interventions. Although the present worldview of Science admits no outside source in its linear view of the future, it does allow for intervention in the form of "random" or "probabilistic" events. Events such as an assassin's bullet in Dallas, an unanswered memorandum sent by Ho Chi Minh to President Wilson at Versailles during the 1919 Paris peace talks, a series of cloudy days juxtiposed with a misplaced key left in Becquerel's laboratory drawer in 1896 are examples of events that intervened in history. Science would consider these events chance; an earlier worldview would consider them Providence. The dilemma for those of us who have been reared in the tradition of causal determinism is that we cannot imagine discontinuities without [redacted]strophes. But before resigning [redacted]lves to some stoic stance before the inevitable, we would do well to consider *what* it is that is coming to an end before the turn of the century.

Sometimes very common conditions and states of being prove difficult to recognize and define. It would seem that the differences between being alive and being dead are sharp enough so that there is little difficulty in separating one from the other. Generally for organisms this is so, but in the case of ideas or worldviews there are difficulties. Worldviews do not always fall down when they die. They often continue to communicate, consume resources and energy, and get in the way of the living. If they do all these things, it might be questioned whether they are dead, and perhaps "clinically" they are not, but in terms of filling needed functions they are no longer operative. A useful definition of worldview vitality is its ability to energize. A worldview would then be considered dead when it no longer was capable of energizing or motivating. If we apply this definition in our present situation we see, with some apprehension, that some of our most basic concepts and images, if not dead, are in the process of dying. The number of people energized by the ideas of *progress, objectivity, causality, probability* and the images of time's arrow or origin by accident is diminishing. The power of *expertise, credentialism* and *certification* to motivate those whose allegiance they still claim, is declining in spite of the desperate cosmetic efforts taken to disguise their state of demise. A young space scientist recently pleaded for continuing our efforts to explore space: "we need food for the mind and the spirit... by exploration of the solar system we will find out, and make better, who we are." In other words, we must explore to revive the human spirit. What he does not understand is that exploration does *not* vitalize the spirit. It is the vitalized spirit that creates the imperative to explore. The death of any worldview is alarming because its collapse, like a Richter 9 earthquake, can level even the most enduring structures. In the case of the present Western worldview its demise is especially perplexing and troublesome because it has only recently come of age and was thought to be in its prime with a long and vigorous future. Further, no previous worldview has enjoyed so many successes nor achieved so much toward the mastery and control of the material world. But whatever the regrets, the facts are that the spirit of humanity is no longer nurtured by the scientific worldview. Increasingly, individuals no longer find dignity and meaning for their lives from its cosmologies, nor are their imaginations fired by its pursuits and goals. In its collapse, the expectation of a discontinuity is real.

Discontinuities and catastrophe are one and the same only if we live in a one level universe. But we know that we do not exist on one level alone. Our ability to imagine future catastrophes is itself evidence that we live on another level. We do not have to resign ourselves to continue suffering the paralysis of Alvin Toffler's future shock. Nor are we necessarily fated to continue the misuse of language that technology demands, for as Northrup Frye reminds us in his *Educated Imagination,* the use of language is cultivated, and freedom from determinism follows once we learn how to use language on a level other than that of communicating information or asserting the ego. It works like this: each of us employs language on levels different from that of ordinary speech when we imagine the future. *In fact, consciousness is a series of movements between levels.* Whether or not we can observe this process in ourselves, we may witness this series of increasing separations between levels in a growing child. A very young child cannot make the differentiation between the levels of "I" and "Not-I" with any degree of continuity. Only after five or six years of age is a child's ego sufficiently stable to retain images of I separate from images of Not-I. The ability to retain images of things not present to the senses is what we commonly mean by imagination, and in the earliest stages of consciousness the use of language is primarily the use of nouns and adjectives to name and qualify these images. Once the child begins to act instead of react, he begins to do things to the environment in the interest of his own survival. Second level consciousness requires a language of verbs describing action and movement; the separation on this level is between "my" space and some "other" space. The successful manipulation of the physical environment requires that language transmit information about these spaces. Here consciousness is concerned with satisfying needs such as food, shelter, safety, or sex. But once this level is realized, a differentiation between "what is" and "what could be" is potentially present. If this separation is made, images of the future become the reality affecting behavior in the present. On this level, imagination—the ability to retain images—not only includes the naming of objects of the second level, but consciousness now possesses the ability to retain images of "what is" and "what is ideal." The use of language on this third level is not the self-expression of the ego, nor is it the communication of information about the environment. Here, language is used to express the ideal; it employs the use of metaphor; it is the language of literature and myth.

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Clearly this paraphrase of Northrup Frye's notion of an educated imagination in terms of the levels of consciousness is a gross simplification, but it may be excused on the grounds it demonstrates an escape from the one level worldview to which we have all been conditioned. The "I/Not-I," the "I/It," and the "I/Thou," employ language on separate levels. If our failure to imagine alternative futures is as crucial to our survival as many believe, then it is not only important to encourage imagination, but in order that there be the possibility of escaping what is, it is necessary to enhance I/Thou relations as well as to increase our skill in the use of metaphor. Metaphors arising from the I/Not-I level focus on ego differences, those of the I/It level introduce notions of duality—man versus nature, objective versus subjective, known versus unknown—while metaphors of the I/Thou level emphasize the gap separating what could or should be from what is. The level structure of consciousness may also be seen in the language we use to formulate goals. Goals focused on the increase or decrease in the number, variety, or rate of things such as population, resources, or pollution contain images of the I/It level. Goals focused on emergence or novelty such as Teilhard de Chardin's "noosphere" or Andrew Weil's "natural mind" contain images of the I/Thou level. The future does not paralyze those who possess an educated imagination for they are not imprisoned in a one level world and discontinuity is not equated with catastrophe.

In addition to learning how to use language on the level of the imagination, there is something else we can do while waiting for the new worldview. We can refine how we approach the future ritualistically, for rituals have always been employed to transcend the one level existence of the physical world. In neolithic times with Magic as worldview, the future was always approached ritualistically. In modern times with Science as worldview, the future is still approached ritualistically, although we tell ourselves that we approach the future "logically." Our delusion derives from the fact that our rituals of responding to requests for proposals or of hopping planes to Washington in search of grants appear pale and insignificant in light of the expectations on the coming *millenium*. In contrast to other ages our incantations and fertility rites are weak substitutes, but buried among the chaotic happenings of the many group experiments now being conducted are some seeds of potential new ritualistic forms for approaching the future. Some might hesitate to label the participatory practices of *Delphi, Syncon,* or *World Game* as rituals, but rituals are very much what these exercises are—ceremonies to affect the future, complete with rules and liturgies.

Delphi polls are an invention of Olaf Helmer who became frustrated with the reactive, crisis-ridden decision-making practices in the early sixties. He designed a systematic polling technique for eliciting reasoned judgments of experts as a means of overcoming both the lack of accepted social theory and the lack of values on which decisions affecting humans are made. The technique has undergone many refinements since its inception but basically participants who are not known to each other during the exercise are asked to focus on certain anticipated technological and social developments and judge if and when they might occur. Results are collected, tabulated and returned to participants with the request they reconsider their judgments and if they disagree with the group median to state their reasons. A third round repeats the process adding arguments in favor of earlier or later dates. The iteration continues until consensus is reached, usually by four or fewer rounds. Reactions from those participating in Delphi polls suggest that the requirement to consider questions in a committee-free environment extends the imagination. The reflective attitude toward future developments engendered by Delphi may be more important than the specific statistical results. If the purpose of forecasts is futures orientation, not accuracy in prediction, then the elaborate ritualistic procedures utilized in Delphi are a step toward overcoming many of the factual and moral uncertainties that beseige our time.

World Game is the inspiration of Buckminster Fuller who attracts the attention of perceptive youth all over the globe and holds them listening to his every word far into the night in overflowing college auditoriums. The World Game like many of Fuller's intuitions is more often planned than played, but in instances where it has been used, it generally inspires the participants toward a new view of the future. In the form it existed in a few years ago, it is a workshop participation exercise conducted by young people who believe in the possibility of using all available technology to feed the starving, clothe the naked, house the homeless, cleanse the air and flush all tyrants from their seats of power. Gene Youngblood's enthusiasm is typical: "For fifty years Fuller compiled an inventory of the Whole Earth's resources—both physical and metaphysical—and he discovered that not only was there enough to take care of all humanity; there was enough to take care of more humans that would ever live—if humanity could consciously control its own evolution. That's what the World Game is about. Consciousness evolution." The rules of World Game are unstrucutured. Participants come together for different periods of time, and pooling the information available from libraries, UNESCO, wherever, begin to make industrialization work for the whole world. The litanies are Fuller's: "The generalized principles of more with less," "Comprehensive anticipatory design," "Wealth and knowledge can only increase, never decrease." Repeated often enough they may become valid, but whatever the eventual outcome of World Game, the image energizes those who participate.

Syncon is described as a process to explore directions toward a positive future for all mankind. It is a participation exercise developed by the *Committee for the Future,* a non profit organization dedicated "to bringing the options for a positive future into the public arena for decision and action." The procedure is to divide into groups participants from all disciplines and backgrounds in a wheel shaped structure with the assignment to work on problems such as "How do we solve the energy crisis to everyone's satisfaction?" Participants choose the sector they want to work in and after some specified time, usually several days, the partitions separating the groups come down and each group tries to integrate its solution with other sectors. The ritual is based on the notion of integrating parts into a whole and, unlike Delphi, there are no experts. "The input from the guy on the street is just as important as that from the research analyst, the artist, the businessman, the student. All must come together, listen to one another and seek commonality... when everyone affected by a problem comes together to work out the solution, it will be more widely accepted." Being the latest innovation in the attempt to approach the future in some way other than the curve-plotting approach of the scientific worldview, it is too soon to assess the results of Syncon, but ritualistic responses to the increased concern with the future could soon become as plentiful as the predictions.

In the 27 years remaining before the end of the century it appears that three Faces of the future are at least recognized even if they are not used in balance. We see this in the responses to widely discussed predictions of recent months such as the forecasts sponsored by the *Club of Rome.* The global computer simulations of the studies of the Club of Rome extrapolate present trends into th 21st century and show a spectrum of impending catastrophes by mid-century if certain "counter-intuitive" changes are not made in current practices and goals. The reaction to these gloomy forecasts has primarily been in questioning the data, the model or the parameters selected. These are first Face responses to first Face futures.

There have also been some second Face responses, taking the form of "change the setting of the thermostat if the system is getting too hot." Having been forewarned by a forecast, we can modify our goals so as to avoid disaster. Our new purpose must be "cool it." We must become zero-growth oriented instead of growth oriented, and the model confirms that catastrophe would be avoided if we adopted these norms.

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Face three responses adopt the promise of a "techological fix." They accept the validity of the forecast within the constraints imposed by today's technology but do not worry because the technological innovations expected in the next few decades will bring new solutions, and long before there is any catastrophe, we will have headed it off with new sources of energy, food and other resources. Face four responses to the Club of Rome's forecasts have yet to come, for it is easier to *challenge, prescribe,* or *trust there will be some new technological windfall* than to delve into the complex of anthropological, psychological, philosophical and religious problems involved.

Face four is the task of the humanities—the transmutation of experience into wisdom. Face four is also the distinct opportunity of continuing education—the lifelong education that consists of the repeated return of experienced people to exchanges with the academic community. We must internalize the scientific and technological experience of the last three hundred years before we can assimilate the change it has effected. But the process, traditionally achieved through the study of the humanities, has itself been derailed through its absorption of the pervading worldview of science and technology. Science, in its devotion to being value-free, emphasizes the collection and classification of experience. Feeling no responsibility to search for the *meaning* in experience, science is content with *understanding* its results. Hence as we become more scientific we become less concerned with wisdom. As we increase our understanding of the world, we lose touch with who we are. As we gain power over nature through technology, we lose our own inate powers. We, the observers, are reduced to the level of those systems we observe.

The humanities lose their position as the integrators of experience and become but one more specialized discipline in the compartmented wheel of knowledge.

To rediscover the fourth Face by which we may see the future, we must go beyond being scientific and become *unscientific.* This means that we must restore value judgments—ethical, esthetic, altruistic—to their proper place in our considerations. We must admit to finalistic as well as causalistic processes within the line of time and to the existence of sources and processes completely outside the line of time. We must honor *all* of our experiences, even those which science cannot fit into its constructs; and especially we must renew the asking of *why* questions even though it is unscientific to do so. For the asking of *why* questions is not to solicit an answer, it is to energize our search.

If we can transcend the scientific in these things, the demise of the present worldview need not lead to the discontinuity of catastrophe, but can lead instead to the discontinuity of rebirth. The future that is considered locked within the channels of determinism will be released once more to human aspirations. Innovations now spawned by mere feasibility will be filtered by human needs and values. Goals that now limit human potentialities will give way to goals worthy of human pursuit. And finally, what has been called *miracle* in the present worldview will cease to be miraculous and will find its rightful place in an order greater than the scientific order.

Editor's Note: Dr. and Ms. Wilson, astronomers and futurists and husband-wife team, have taught UCLA Extension courses in Futures and Forecasting for several quarters. Now, in their new series, ***Machine, Myth and Metaphor,*** offered this fall for the first time, the noted scientists draw upon their considerable background in the humanities to bridge the gap between the disciplines in order to illuminate what each has to offer the other.

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