

PATTERNS

From the Editor:

In the course of putting this issue of PATTERNS together we became engrossed in an internet conversation with Tom Mandel about the properties of emergence. So, what was intended to be an issue on living in the design way, gathered from the recently published book, "The Design Way: Intentional Change in an Unpredictable World," by ISSS past President Harold Nelson and Erik Stolterman, is enriched and deepened with a wider perspective.

We have drawn on the insightful directions for how to prepare and take a Harvard Medical School Course on Emergence. Dan Goodenough refers to the dangers of taking this course by drawing on the teaching of Joanna Macy who in the 1980's helped us to face up to the threat of Nuclear War. She writes:

"Learning about the health of the planet can be very scary, depressing, and put you into a state of despair...Despair translates into disbelief, denial and living a double life: living "normally" with the inchoate knowledge that the world is dying."

"Why do we live this way? There are a number of different reasons: due to fear of pain, of appearing morbid, of appearing stupid, of guilt, of causing distress, of provoking disaster (superstitions), of sowing panic, of religious doubt, of appearing emotional and weak, of feeling powerless. This gives rise to a sense of a separate existence. Due to the current paradigm that we are all separate entities means that despair is a private neurosis. So we repress our fears, but at a cost."

If we are to understand what the "design way" is all about we must look

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Desiderata

That-which-is-desired

Editor's Note: The Design Way: Foundations and Fundamentals in Design Competence, written by Harold G. Nelson and Erik Stolterman, is a ground-breaking book. Published by Educational Technology Publications, Englewood Cliffs, New Jersey, 2003, it gathers together a composition of a broad and deep understanding of design. The authors write;

"We believe the culture of inquiry and action that infuses design thinking is an essential part of the palette of human traditions. Yet design has remained surprisingly invisible and unrecognized. This book is an attempt to change this by recognizing design as its own tradition and formulating its fundamental core of ideas.

It is not a book about design praxis, which deserves several books of its own. It is not something exclusive to professional designers. It is a way to approach reality that intentionally embraces its vast richness and complexity."

We have taken excerpts from the chapter outlining one of the fundamentals of design thinking—Desiderata, that which is desired.

"Design is such a natural human ability that almost everyone is designing most of the time—whether they are conscious of it, or not. Framing our understanding in this way, we will use the concept of design to define, and promote, a new philosophical tradition; a new culture of inquiry and action."

Change in our world can be initiated in basically two ways. We can act because we want to move away from a situation we do not like, or we can act towards an imagined and desired situation.

Too often, the good intentions that arise from the recognition of a need for change lead to paralysis. Analysis paralysis occurs when too much divergent information is generated, without effective means for convergence. The paralyzing effect of confronting wicked problems, rather than tame problems, comes from bumping up against the limits of rationality itself.

We live in a time of the "something more." The challenge in design is not to allow analysis to become the dominant or exclusive rational thinking process. The benefits of analytic (i.e. scientific) thinking are often accompanied by the disastrous effects of logical dissection as a means of studying the elements, components or qualities of things in isolation from their intact whole. Emergent qualities displayed as patterns, compounds, functional assemblies, wholes or compositions disappear when disassembled into constituent parts. Wetness, a quality associated with water, is an emergent quality resulting from the combination of atoms of hydrogen and oxygen. Life, as an emergent quality of biologic systems, disappears when the living plant

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courageously at "what is" to gain the strength to work for that which is desired. We have chosen excerpts from the book's chapter, *Desiderata: That-which-is-desired* as our lead article.

The authors have chosen to use three unifying elements, *foundations, fundamentals and metaphysics*, in writing **The Design Way**. They write that "over the years, we have found that there are emergent patterns informing the composition of our ideas as a whole. We find that it is possible to make a composition from this tripartite relationship; one that reflects in different ways, what we see as the core of a design approach—a design way."

The importance of this book lies in the recognition that "leadership today demands action and the ability to act, based on an overwhelming amount of insufficient information within restrictive limits of resources and time. These demands cannot be met solely from within the traditions of science or pragmatic technology. These demands require leaders to imagine and implement adequate responses that are sustainable—in all their implications. **This is a task that calls for judgement—not problem solving.** It calls for *good* compositions—not *true* solutions."

Our analytical view derived from the scientific perspective visualizes nature as female from which secrets are revealed, and describes nature as a thing that can be dissected and understood in its parts. But it is obvious now that we have a need to perceive nature as an integrated whole.

In the preparation for the course given by the **Center for Health and the Global Environment**, Goodenough reminds us that "The roots of our perception of nature begin with Euclid, Pythagoras, Newton and provide a framework for analytical reductionist thinking. Analytical reductionist thinking allows analysis of a problem by separating it into its constituent parts with each part having an intrinsic function. The mechanistic/analytical reductionist method does not work in understanding complex systems."

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or animal is dissected into elemental components. Abstract entities such as community or family, similarly lose their emergent qualities when divided into individuals for analysis.

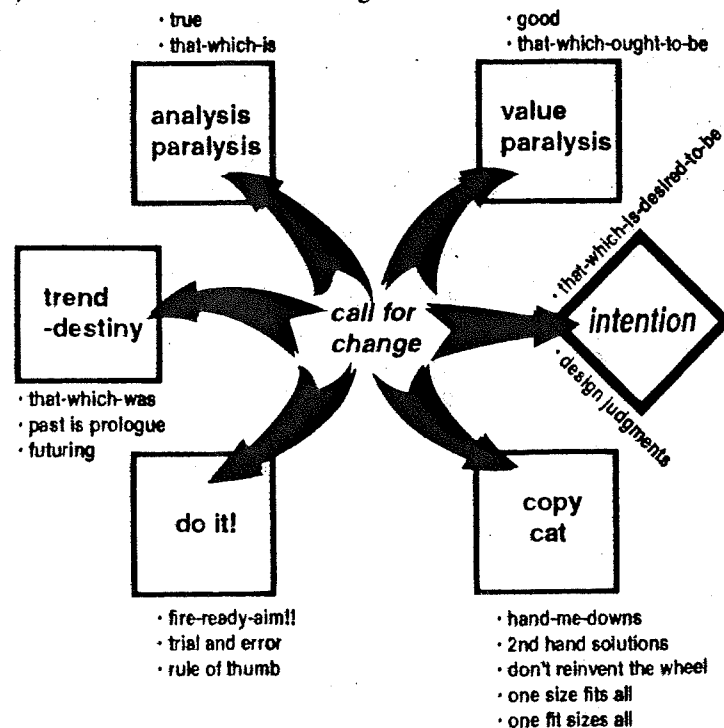
Value paralysis occurs when any and every value system is taken into account without any means of transcending the differences and diversity. The paralysis of holism occurs when there are not automatic means for bounding or limiting comprehensive expansion.

This unfortunate situation exists because all of these strategies have a common foundation in 'problem solving'. Their focus is on only that-which-is (description and explanation, science), versus that-which-ought-to-be (ethics and morality), without consideration for that-which-is desired (desiderata)

We also create changes based on what we want, including that-which-can-be, as demonstrated by our emphasis on technologic innovations. We can create everything from biologic clones to smaller, faster, more complex electronic devices. Because we have the ability to create them, we then become convinced we want them, and that they are needed. Yet, even though what we want is most often driven by our immediate short-term needs and interests, there is always a deeper, more profound sense of want, which is expressed in the aesthetic terms of values. This deep sense of wanting occurs even without a belief in natural order.

In any particular situation, however, there is never just one approach present. Depending on what we perceive as the basis for intentional action, there will be different proportions among the three, aesthetics, ethics and reason. In real-world contexts, everything is a blend.

In this book, we use the concept of desiderata (i.e. desires) as an inclusive whole. That is, we see it as a concept that includes all three of the following approaches: aesthetics, ethics and reason. But, within this concept, the aggregated effect of these three approaches transcends their summation, forming an emergent quality that is characteristic of compositions, or wholes. Desiderata are about what we intend the world to be, and is the integrative outcome of all three approaches in concert. It is the escape route from the strategies for change, which box us into paralysis, blind action, or slavish mimicry (see illustration) Desiderata are the voice of design.



In today's world, the newspapers are filled with reports of action that came from a reactive need for change. Regardless of whether it stems from business, political, or personal affairs, change emerges out of negative responses to events, or situations in the world. The justification for action arises out of what we fear, what makes us angry, what

hurts us, what we hate, or what is humiliating us. Politicians in democracies around the world demonstrate leadership by identifying which, of the many things that threaten us, ought to be dealt with, in which order and in what way. Voters participate by identifying all their own reactive issues__scared into action against threats both real and imagined.

These reactive responses lock us into an understanding of the world through the filter of problem solving. Russell Ackoff (1978) has pointed out that getting away from what we don't want, does not guarantee that we get what we do want. On one level we inherently understand this. We know that if we back away from danger, we might back into an even more dangerous situation. Still, everyday conversations are filled with the language of problems, problem recognition and problem solution. But as we've intimated earlier, rather than allowing our various problems to run our lives, we would be wise to approach the world from a design perspective and engage our desiderata in our approach to intentional change.

As stated earlier, the term, desiderata, refers to those things that are desired. Desiderata can be expressed through three distinct domains: the mind's desire, the heart's desire and the soul's desire. A desideratum is something that is roused out of a want, a desire, a hope, a wish, a passion, an aspiration, an ambition, a quest, a call to, a hunger for, or will towards.

In our culture, desires are often treated as low-level needs__things that we wish for but could live without. But desiderata are not a response to the problem of an unfulfilled human need. The negative impulse towards action, which arises out of such a felt need, is completely different form the positive impulse born out of the desire to create situations, systems of organization or concrete artifacts which enhance our life experience. Rather than treating the source of these aspirations as needs, we believe it is helpful to refer to them as design intentions.

Desire can be understood as the 'force' that provides us with intrinsic guidance and energy. As humans, we use our desires as a way to understand how we can fulfill our lives. But desires are not all good. To find out what we desire, we have to name them, reflect upon them and examine them. To differentiate positive desires from negative ones is one of our lifelong tasks as human beings.

Let's take a look at an example of a desideratum that functions as a guide. The desire for love is universal, but it is experienced differently, depending on the particular design of inquiry and action we choose (see illustration) In the real, love takes on the form of eros__love of the physical world. In the true, love is manifested as agape__an abstracted form of social love. And, in the ideal, love is elevated to philo__an unconditional love of the ultimate.

Designs of Inquiry & Action

Desideratum	the real	the true	the ideal
love	eros	agape	philo

This example of love, as a particular type of desideratum, seen through the lenses of three different forms of intentionality, demonstrates the symbiotic relationship between desiderata and intention. In a philosopher's sense, intentionality is much more than just intending to do something. It means any way that the mind has of referring to objects and states of affairs in the world (Searle, 1983). As Searle points out, it is one of the two basic states of mind, consciousness and intentionality. Furthermore, he argues that intentionality, itself, is two-pronged, consisting of belief and desire. It is at this level of resolution within the very big idea of intentionality, that the concept of design intention, as an expression of that desire is developed.

The intentional approaches associated with design also happen to be fundamental to the development and application of good leadership. This is no accident. Leaders require many approaches and skills to wisely guide their followers. One of the most important, yet most undeveloped, is design. Two terms often define good leadership; these

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introduction/how/transcript.htm>

Nelson and Stolterman, arguing the need for a design culture as different from our present scientific culture, point out that nature does not exist in isolation nor is humanity a collection of individuals in proximity to one another. ***“Everything is in relationship to everything else with varying levels of criticality and intensity. These relationships produce qualities and attributes such as Complexity, arising as a consequence of the dynamic interactivity of relationships. “Complexity is the rule of the real world while simplification or reductionist thinking, such as ignoring relationships and concomitant emergent qualities is a dangerous distraction.”***

Central to the book, ***The Design Way***, is that the systems approach is the logic of a design culture. “Everything exists in an environment and within a context. Such assemblies of functional relationships lead to the emergence of phenomena that transcend the attributes and the qualities of the things themselves.” An example of emergence is a house, a functional assembly of construction materials, until it is experienced holistically as a home__not merely a building. ***“Since life itself is an emergent quality, an attribute of functional organic assemblies, it is literally life threatening, when dealing with living systems, for relationships to be ignored or broken through the intervention of reductive thinking or action.”*** (pp. 73-74)

Nelson and Stolterman state that ***“Design is not the pursuit of an ideal concept. It is not the creation of an ultimate vision, in a perfectible world, where everything, including sufficient information, authority and resources, is in the hands of the designer. On the contrary, design can only be fully actualized by all the circumstances and specifics that make a design situation uniquely particular. We are not trumpeting compromise, or surrender, to the imperfections, shortcomings and incompleteness of each unique situation. Instead, we are asking you to explore the splendor of the possible,***

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This reminds us of another groundbreaking book, *A Pattern Language*, by Architect Christopher Alexander and his colleagues at the Center for Environmental Structure in Berkeley, California.

It is the second in a three volume series which describe an entirely new attitude providing a complete working alternative to our present ideas about architecture, building, and planning—an alternative which the authors hope will gradually replace current ideas and practices.

Two core ideas of these books make them examples of the emergent process. The idea that people should design for themselves their own houses, streets and communities based simply from the observation that most of the wonderful places of the world were not made by architects but by the people. This implies a radical transformation of the architectural profession.

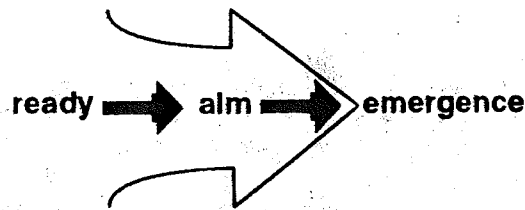
The second core idea is the point that in designing their environments people always rely on certain “languages” which, like the language we speak, allow them to articulate and communicate an infinite variety of designs within a formal system that gives them coherence.

We revue their treatment of the teenage society from the perspective of the balanced life cycle. They suggest that the longer process of maturation that we call adolescence (new to the world since the industrial revolution) carries with it an extraordinary hope—that of a more profound and varied self-conception.

Bob Abramms has a video, *Many Ways to See the World*, a powerful message using analyses of maps emphasizing that we can only understand the world if we are willing to see things from multiple perspectives. Check out www.diversophy.com/maps.htm for a free download of Chapter One. They also offer free reproductive rights for non-commercial use. For materials and training seminars contact: ODT at 800/ 736-1293 or www.petersmap.com

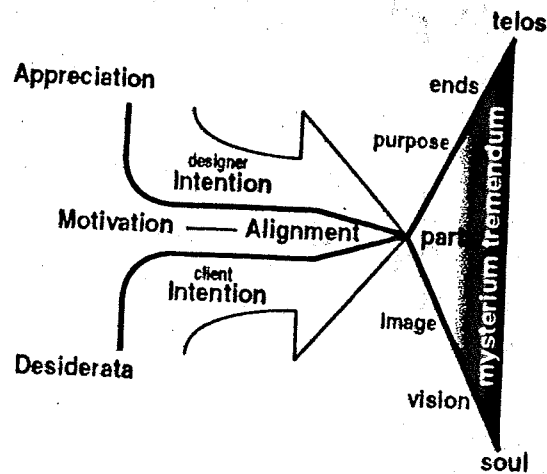
are character and vision. Vision becomes something that is given, a solution to a problem. Strategic planning, and similar methods for the management of change, have grown out of the belief that vision, and visionary leadership, are a priori factors in any intentional change process.

On the other hand, intention is best understood, not as a vision, but as the aiming and subsequent emergence of a desired outcome. (see illustration) Desiderata help to aim and form one’s intentions. Unlike a vision, the outcome is not there when the process begins. The outcome only emerges based on the situation, desiderata and intention. This process is very different from many common approaches, where action is seen as a consequence of a defined goal. Intention is not only about where to go, it is also about how to get there—how to aim so as to move closer to our desires.



Within the Zen tradition, a deep understanding of intention, as a process of aiming, has been developed. In the classic book *Zen in the Art of Archery*, Herrigel (1953) shows how the notion of aiming can be developed by careful attention and by letting go of our everyday assumptions on how to reach our goals. In the case of design intention, vision is the outcome of a process triggered by desiderata that is framed and contained by appreciative judgment (distinguishing foreground from background). It is animated by motivation and the design insights that are revealed as a consequence of the above encountering the “mysterium tremendum” (the great mystery of the human condition) emerge as an intense, but undifferentiated, seed of wisdom, known as a parti.

Through the design team’s energy and focus, the parti is developed into an equivalent image. From which vision is then formed. Therefore, vision is the outcome of creative, design-based leadership rather than the starting point.



Just as vision is an outcome of an intentional design approach, so too emerges an ultimate understanding of purpose. Neither vision, nor telos, begins as input. Leadership is not defined by a particular role, or a blend of character traits, or a position in a hierarchy, but as the consequence of participation in an authentic engagement with the process of evoking vision from an initial expression of desiderata. Desiderata needs to be matched by an appreciative judgment of what is to be considered real, in any particular situation. It is not a comprehensive description of what is real (Vickers, 1995). Instead, it is a judgment of what is to be treated as the essential background, or foreground, of the design situation.

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Motivation is also key to any design leadership process. In design, motivation must be intrinsic, but can be augmented by extrinsic influences as well.

The ability to create an alignment of the independently powerful and capable minds of those involved brings focus to, and magnifies the potential within the design process. A popular metaphor for this alignment is jazz improvisation. Each musician plays impromptu, yet contributes to the musical unity of a collective effort. Participation in alignment has been characterized as the experience of flow that is an experiential state of cognition without the normal distinctions and distractions of measured time and space—an analog state of being. This concept also has application to individualized activity, as an unselfconscious experience of empathy timelessness and unity (Csikszentmihali, 1990).

Design is the change of evolution into an intentionally directed process rather than a consequence of necessity, luck or accident. Reactive triggers to change, such as fear, hate, hurt, humiliation, anger, distress and need, drain energy and hope from human potential. Desiderata create energy and hope, fueling the generative capacity of humans individually and collectively. Desiderata reflect the innate human understanding that the world is not complete as it is. Desiderata make design possible and necessary



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In our last issue of PATTERNS we mentioned the felt need for enhanced communication among the various professional societies in the systems field, the new sciences, educators, and the general public.

We are in the very preliminary stages of designing a publication dedicated to inter-field, interdisciplinary, international, intergenerational conversation and communication about the relationships between people, ideas, science, art, psychology, systems (natural and human made) etc. It will be a publication that hovers flexibly between being an academic publication, and a non-commercial magazine. PATTERNS will function as an open living system.

We will be working closely with, and accepting submissions from academics, artists, writers, cyberneticians, researchers, political leaders, and thinkers of every variety. We, therefore, plan on having a wide reader base and appeal.

Submitting persons will be asked to consider broader implications as well as the specificity of their own fields. Relations, connections, and workable ideas and action will be emphasized. Critique, response and counter-response to articles will be encouraged.

PATTERNS will also have a web based forum component designed for the exchange of ideas, organization of community, outreach, and designing of actions. Since 1996 we have tried to fill a niche that has not been served. We pledge to connect thinkers in a way that fosters thoughtful action, instead of intellectual repetition. Through discourse/conversation and design, PATTERNS will search for working, open systems which serve a greater good for the world. Our core values are humility, compassion, awareness, creativity, practice, community/network and freedom of self-definition. Our intention is to create as transparent a publication as possible.

Reflections

We want to share with you some of the thoughts of **Thom Mandel** who maintains the on-going dialogue in the **International Society for Systems Sciences (ISSS)** listserv. He writes:

Systemics is not about what things are. What things are is the elementalistic domain of classical science. What things are is a Western idea, based on the assumption that a thing is what we call it. It has to do with the dependance on language, and the Western notion that knowledge is rooted in language. To know is to know the word. But, as Korzybski reminds us, the word is not the thing. And Wittgenstein informs us that meaning is not found in a word but in the context the word is being used in. What does "work" mean?

An example of what I mean is illustrated by a story about a garage sale. What is a chair? A chair was being sold at a garage sale, and three people were looking at it. One person was a lumberjack, and he noticed the kind of wood used to make the chair, "It is made of Red Oak, and thus is a sturdy chair." The second person was a carpenter, and he noticed how the wood was joined together, "It is glued and pegged, and will last a long time." The third person was a housewife, and she said, "It may be sturdy and probably will last a long time because it is so uncomfortable no one will sit in it."

If Capra and Wilber are right, then the system is a Western version of the Eastern "Dharmadhatu." I once had thought so. But it turns out that most (not all) systemists still think of a system in terms of elements. They think of the many elements involved and call this complexity. They wonder why they can't find the ontological foundation of their "complexity." Or they think of the diversity of the many elements, and wonder why there is no unity in their thinking.

Wilber writes. "Thought does not report things, it distorts reality to create things, and, as Bergson noted, "In so doing it allows what is the very essence of the real to escape." Thus to the

Laws of Emergent Properties

by Dan Goodenough

Because the way in which you look at things will affect the outcome of the observed phenomenon, concepts from the subatomic particle to the complex system must be rethought.

- Any emergent property that comes up must preserve everything that came before it, and must interconnect underlying subsystems.

- Emergent properties can only be sustained by use of energy.

- With each step (level of emergence) we must invent a new language to talk about it. New mathematics/laws and rules for predictive value. For example, instead of breaking apart, let us build up and consider emergent properties. The wavelike probability of interaction at the smallest level is the fundamental beginnings of matter. When the probability of interactions are high we observe the creation of the subatomic particle. We invent math and science to describe them and predict their behavior.

Subatomic particles again interact and atoms form. Charge appears. Before the interactions there was no charge. **Charge is an emergent property, a property that accrues because of an interaction.** Charge is also represented in quantal states of an atom that needs a new math and a new science to predict interactions.

When atoms get together, molecules are formed and the emergent property is temperature.

Macromolecules interact and binding constants and affinities become apparent.

Life is an emergent property.

Groups of cells come together to form the nervous system and from that emerges free will.

Terrorism is an emergent property of the current state of our world—its economics, racism, sexism, over-population, and pollution. Targeted removal of a group will not solve this problem, because it will emerge somewhere else.

We must look at the interactions that supported the emergence of such an event rather than dissect out a part which is at fault.

Harvard Medical School Course On Emergence

...How to Take This Course

by Dan Goodenough

"Sometimes the magic and the glory are less in the thing itself than in how it comes to be. And so it appears to be with the self. It took nearly four billion years of biotic evolution and a hundred thousand years of cultural evolution to organize selves who are capable of composing and comprehending this sentence, and neither you nor I had anything to do with it. For what it is worth, to be a self is to inherit a fortune of organization. Our part is merely to invest it."

Loyal Rue

Why Should We Take This Course?

In the United States, there is a standard medical model and belief system based on empiricism.

Upon encountering a disease, the problem is approached analytically, using empirical thinking: gathering of data (facts) to make a diagnosis of what part of the whole is broken. With the revolution of molecular biology, enormous resources are focused on delineating which molecules are "broken" and designing technologies to repair or replace the non-functioning molecules. These are very powerful, exciting and noble goals, and we are on the brink of even fixing genetic defects. But human health is not only dependent on the correct functioning of the molecular components of the human body. The human body is also dependent on its context (environment) for health. This presents a problem for the standard medical model and is one reason why we take this course.

The medical model is focused primarily on the individual person, again appropriately so, since the treatment of many diseases involves in part treating the individual. However, the model does not provide for the complete health of humans, since certain diseases are the result of interactions of the human body with its environment. In the area of mental health, for example, new models of treatment have appeared which have their roots in the study of social systems, families, and interpersonal interactions. The context in which we live is dauntingly complex, and resists understanding by analysis alone. Thus, reductionistic, analytical thinking does not yield usable therapies when thinking about our interactions with environment in which we live.

*We focus our resources on finding
solutions to problems
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developing preventive solutions.*

The medical model is focused primarily on the treatment of disease, not the prevention of illness. This bias is not restricted to the medical community alone. Indeed, a crisis-oriented culture has developed in this and other countries wherein we focus our resources on finding solutions to problems rather than studying causes and developing preventive solutions.

The medical model has failed to incorporate the new cosmology. The medical model is fundamentally rooted in the Cartesian/Newtonian model of reality. The ideas of the founding fathers of analytical scientific thinking, Descartes and Newton, have led us to assume that everything can be understood by analytical thinking, that we can be outside that which we observe and study, that the human mind is able to separate itself from that

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which it is analyzing. This creates a duality that the mind is separate from the body, the body from its family, community and social space, and that therefore humans are exempt from being innately biological. A corollary of this belief system is that if something cannot be understood by analysis, it is not real but rather in the domain of emotions, and thus not scientific (and not really worth seriously thinking about). However, the molecular revolution has provided incontrovertible evidence of our origins from stars, of molecular evolution, of the total interrelatedness of all life forms on our planet, and of our absolute dependency on other life forms for our health. We of course all believe that we are biological, but we do not behave that way. We act as though the rest of the biological world is different from us, and that it is all here for our use. We act as if each human life is totally sacred and that we have the ethical mandate to do whatever it takes to save each individual. (But wait: we also know that this is a very stratified concept, that resources will be spent on some individuals and will be denied others, so our ethical mandate is indeed riddled with racism, classism, ageism, homophobia, and nationalism).

*We believe that we are biological
but we do not
behave that way.*

The medical model is also rooted in Western cultures. In Western cultures, the scientific Western culture is economically founded on individualism as well. Capitalism laws hold that the individual is an independent entity, and that the individual has the (god given?) right to grab everything possible, at the expense of others. Capitalism does not have any innate morals or spirituality, therefore governments are required to impose morals on capitalistic urges. Unfortunately, while there is at least healthy debate about the separation of church and state, there is very little effective debate about the separation of capitalism and the state. So in thinking (the analytical model), feeling (Judeo-Christian beliefs) and doing (capitalism), Western culture and its medicine is strongly biased towards the individual who is above (outside) the environment in which we live.

In summary, the medical model has focused on the individual patient, and has used successful reductionist paradigms to treat human disease to the point of being at the brink of being able to repair defects in the human genome itself. But health professionals cannot afford to think only reductionistically, they must also think systemically. Systemic medicine includes knowledge of nutrition, preventive medicine, occupational medicine and global environmental medicine. A new medical model must see the individual person, ourselves, as part of the biological fabric of the planet, rather than outside of or independent of our context. As a species we are part of the whole, and our health as a species depends on the health of the whole. We can individually escape for the short term by practicing environmental racism, that is, to continue to provide for a subset of our species at the expense of others. But brief reflection on this practice reveals that it will catch up with us over time, that due to our interrelatedness, what happens to a part must also happen to the whole.

*Health professionals stand
at the interface of this process.*

Health professionals stand at the interface of this process. They see the manifestations of the environmental degradation on human health, their patients, first. Our medical education needs to help health professionals recognize the signs of environmental damage on human health. As members of their communities, health professionals will be the spokespersons, educating communities about what is dangerous in their environment, about why we are getting sick. Politicians and other community leaders cannot do this. The AIDS epidemic provides a tragic example of how politicians are content to practice environmental racism, to look the other way while the underprivileged and poor suffer and die, only to awaken to the grim reality that the politician's children are now infected, that the highest risk population for AIDS is currently "regular white folks" in high school.

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How To Take This Course

Part of taking this course means that you will be receiving a lot of bad news. It is perceived that we must be out there "saving the world" while keeping our emotions deep within us. We must be aware of our affect during this course. If you feel the feeling of diffuse pain and a sense of aimlessness, an inability to sleep and focus (can't do a task), or are worried about laughing at a joke because so many people are in so much pain, please acknowledge the pain and do not deny it.

Helen Caldecott, a physician from Australia who wrote widely and deeply about the devastation of nuclear war...gave us a vivid image, but no hope or strategy to not feel helpless or powerless. We must pay attention to our feelings of helplessness and powerlessness. It is this helplessness that none of our respective institutions is comfortable speaking about.

It is important to acknowledge our presence here in this course and to engage in the problems. *We must take care of each other and take time to reflect, stop and let the pain come in.* If it is not honored, it will eat away at you and it is destructive. You feel the pain because you care and it matters to you what happens to people, and that makes you especially human. As soon as you care, you are vulnerable and may become angry if people destroy what you care about. *If you move through the pain to its source, you may rediscover a place of caring for the self, for humanity, and for our identity.*

The core of being human is to constantly try to move to that place.

We need to explore the power of interconnectedness, watch each other's backs, and ask each other how we are doing.

The Center for Health and the Global Environment welcomes your comments and feedback about the website.

<www.med.harvard.edu/chge/course/introduction/how/>

*Please contact them at
chge@hms.harvard.edu*

Redefining Love & Intelligence

Humberto Maturana's
Biology of Love

Sunday, October 26 and
Sunday, November 2,
2003

Santa Cruz, California

Facilitated by Claudia L'Amoreaux,
Director, Haven Learning Center
Berkeley, California

*How we live determines
what we become;
the manner of living, not the genome
which supports our living,
is the basis of evolutionary change.*
Humberto Maturana

Chilean Neurobiologist Humberto Maturana is at the forefront of a paradigm shift away from physics to a new biology as the central model for the sciences. He turns our current understanding of what it means to be human on its head with questions like "Love and aggression—are they polar features of our biology or, of our cultural human existence?"

The workshop format will examine Maturana's work in the context of a highly interactive learning conversation that will include readings, video presentations, and reflective practice. Short introductory readings will be suggested prior to the first session.

Claudia L'Amoreaux is an educational consultant and learning coach. Her clients span Education, Entertainment, Business, Government and Environment. She has worked in the Pacific Islands, North and South America, the Middle East and Europe. Her work has been featured on BBC World Radio in their *Essential Guide to the New Millennium*, on the internationally syndicated television show, *New Media News*, and in a film, *On the Wild Side Meetings with Remarkable Women*. She co-authored the book, *Creating Learning Communities* (Solomon Press, 2000). She is a founding member of the Meta-Learning Lab and directs the Haven Learning Center in Berkeley, California.

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We acknowledge that whether one believes that we are in an environmental crisis or not, the rapidly expanding numbers of humans on the planet earth will eventually create a crisis. While not as evident in this country, already large populations of humans have died because they have exceeded the carrying capacity of their locale, a carrying capacity made smaller by overgrazing and by turning geographical areas into a dust-bowls.

Health professionals must be educated and be active in their communities, so that we do not repeat the same tragedy with our water, sunlight and air. Water is a global system on this planet. If it goes bad for the poor, it will go bad for the rich. If the Chernobyl reactor had eaten through its concrete base, and injected Plutonium into the ground water of Russia, it would have been only a matter of time before the whole planet had Plutonium in all of its water. Water does not understand national boundaries. These are some of the reasons why we must take this course.

How to Take this Course & Emergent Properties

Hierarchical systems are pyramidal in shape, so that there are countless atoms but (as far as we know) only one earth. Within each stratum of structure of the pyramid, there are rules and laws, which have been uncovered by scientists over the past 3-400 years. Within each stratum, the entities which exist there are free to interact according to those laws. However out of those interactions emerge structures and functions which cannot be predicted by the rules and laws which govern that stratum. This is often glibly stated as The Whole Being Greater than the Sum of Its Parts. Consider one stratum. Atoms do not have temperature. Temperature is an emergent property of the interaction of atoms. Using quantum mechanics, you cannot deduce temperature; it is a mechanical property of pressure and volume, which requires interactions of atoms. We find this rule applies all the way up the pyramid as smaller objects interact to define new strata. The process of a new property emerging also obeys laws:

First Law: An emergent property must preserve underlying subsystems.

Second Law: An emergent property must interconnect underlying subsystems.

Third Law: Emergent properties are negatively entropic and therefore can be sustained only by using energy.

Fourth Law: Cannot deduce next emergent level using rules developed within a level. Therefore new language and rules must be invented and deduced to describe emergent behavior.

Human Health and Global Environmental Change is a course that focuses our attention at the top of the pyramid. To do this, we must become systems thinkers in addition to analytical thinkers. Analytical thinking, the breaking down of a problem into its component parts and studying their properties, does not work when studying complex systems. As Fritjof Capra states: "The great shock of twentieth-century science has been that systems cannot be understood by analysis. The properties of the parts [of a complex system] are not intrinsic properties but can be understood only within the context of the larger whole. Thus the relationship between the parts and the whole has been reversed. In the systems approach, the properties of the parts can be understood only from the organization of the whole. Accordingly, systems thinking concentrates not on basic building blocks, but on basic principles of organization. Analysis means taking something apart in order to understand it; systems thinking means putting it into the context of a larger whole."

These ideas are not new and are easily traceable to Goethe and Kant. Like many nineteenth century philosophers, Kant struggled with the comparison of machines and biological organisms. He noted that the parts of a machine existed in order to work together while the parts of an organism exist *because* of each other, in the sense that they made each other. While it is helpful in many contexts to think of the planet as a "thing" with mass, velocity, angular momentum, chemical composition, etc., Lovelock's idea of Gaia resists analysis and must be thought of as a network of interactions. These

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interactions result in the creation of Gaia.

In this course, we will try to understand the science of each of the levels which interact to create the biosphere and the planet. To do this we must integrate all the sciences, from quantum mechanics through biology to ecology. But in addition, we must always be thinking of context. Notice that at the very top and bottom of the pyramid, there are only probabilities of interactions, there are no actual "things". As Capra states: "*Quantum theory forced [physicists] to accept the fact that the solid material objects of classical physics dissolve at the subatomic level into wavelike patterns of probabilities. These patterns, moreover, do not represent probabilities of things, but rather probabilities of interconnections. The subatomic particles have no meaning as isolated entities but can be understood only as interconnections, or correlations, among various processes of observation and measurement. This is how quantum physics shows that we cannot decompose the world into independently existing elementary units.*"

Since this is the structure of both the top and bottom of the pyramid, it follows that all the levels in between share the same fundamental structure. Therefore, in addition to thinking of context, we must always be thinking of probabilities of interaction. We must use both analytical and systemic thinking in this course.

So: How to take this course?

- We must continue our training in analytical thinking. Within each layer of the hierarchy, analysis plays a fundamental role.
- We must struggle to be "generalists". While there is endless pressure to become "experts" and to "specialize", we must constantly push ourselves to learn more outside our specialty. We must be specialists and generalists. We must be comfortable reading and thinking about broad fields of science and wide sweeps of history.
- We must learn to think systemically. Our reflex questions: "What is the context?" "How do the parts interact?" "How do these interactions change over time?"
- We must become experts of process in addition to content.
- We must be part of an emergent property. We must not be alone and isolated. We must be interacting.
- We must take care of our despair.

As mentioned earlier, **Joanna Macy** offers five powerful guidelines, five lessons and some process suggestions:

Guidelines

1. Acknowledge our pain for the world. If it is present, we cannot deny its reality. We cannot make it go away by arguing it out of existence, or burying it inside of ourselves. We can acknowledge our pain for the world to ourselves through journal writing or prayer, and communicating to others.
2. Validate our pain for the world. Honor our pain in ourselves and in others, by listening carefully and accepting it as healthy and normal in the present situation. To hurry in with words of cheer can trivialize its meaning and foster repression.
3. Experience our pain. Let us not fear its impact on others and ourselves. We will not get stuck in this pain, for it is dynamic, it flows through us. Stay present to its flow in words, movement and sounds.
4. Move through the pain to its source. Pain is rooted in caring, not just for our children and ourselves but for all of humanity. We rediscover our interconnectedness with all beings. Allow this sense of mutual belonging to surface in whatever words and images are meaningful and share them.
5. Experience the power of interconnectedness. Let us dare to translate our caring into a sense of belonging to all humanity and the web of life. Observe the trust level rise when we expose our vulnerability to pain for the world. Recognize how the realization of interconnectedness results in personal security and economy of effort.

Principles of Despairwork. Five lessons.

1. *Feelings of pain for our world are natural and healthy.*
2. *This pain is morbid only if denied. To speak of sorrow works upon it, moves it from its crouched place, barring the way to and from the soul's hall.Denise Levertov.*
3. *Information alone is not enough.*
4. *Unblocking repressed feelings releases energy, clears the mind. Catharsis.*
5. *Unblocking our pain for the world reconnects us with the larger web of life. The distress is more than concern for self. It reflects concerns that extend beyond our individual needs and wants. It is a testimony to our interconnectedness.*

Dealing with differences of opinion. Nine suggestions:

- Beware of labels and hidden assumptions.
- Don't play total expert. You are more trustworthy if you come off as "not knowing".
- Do your homework, so you can be responsible for what you say.
- Be clear whether you are communicating facts or feelings.
- Don't try to corner the other person.
- Don't be afraid to share personal experiences.
- Don't be afraid to examine differences.
- Be willing to let go of a discussion at the right time.
- Shift, if you can, to the level of deep common concern.

Notice

Because we were unable to publish the June/July issue of PATTERNS, paid members are invited to visit <www.haven.net/patterns/> and order, free of charge, any two past issues from our Index of issues beginning January, 1996

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extent we actually imagine a world of discrete and separate things, conceptions have become perceptions, and we have in this manner populated our universe with nothing but ghosts. "

I think one of the problems is the usage of the old language to describe new thinking. We know that a system of the integrative kind involves relationships, but do we have a science of relationships? Do we have a Relationship Theory? Do we have a language based on relationships? We don't. Korzybski often talked about a non-elementalistic language, but the general-semanticists have yet to come up with such a language.

Again, the problem is the emphasis on nouns (things) whereas the real world works by means of verbs. We talk about what things are, but reality is what things are doing.

This problem crops up in education especially. What would it take to teach a child about language? That by arranging marks in a certain way, letters are created? That by arranging letters in a certain way words are created? That by arranging words in a certain way, sentences are created? That by arranging sentences in a certain way ideas are created?

Our educational system is yet another example of "misplaced concreteness." Somehow the educational crisis has become a crisis of ability, when actually it is a crisis of perception.

So how do we descend from the clouds? I don't think there is any way we can descend from the clouds. I think we can only do the obvious and fall...I am afraid that before anyone can cross over, the prerequisite action is a fall.

<Thommandel@aol.com>

Editor's Note:

See PATTERNS May 1996 for an interview with Gyorgi Jaros titled *Teleonics: The Primacy of Process*

www.haven.net/patterns/

A Pattern Language

by Christopher Alexander, et al

Oxford University Press. New York. 1970 ISBN 0-19-501919-9

A pattern language has the structure of a network. However, when we use the network of a language, we always use it as a sequence, going through the patterns, moving always from the larger patterns to the smaller, always from the ones which create structures, to the ones which then embellish those structures, and then to those which embellish the embellishments...

The sequence of patterns is both a summary of the language, and at the same time, an index to the patterns.

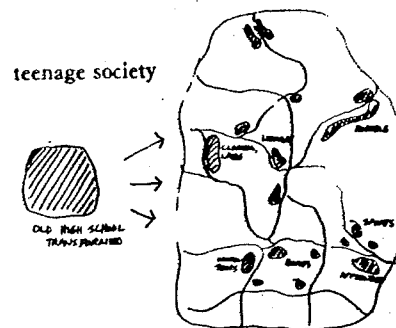
The authors begin with that part of the language which defines a town or community, starting with #1 **Independent Regions**. The first 94 patterns deal with the large-scale structure of the environment: "the growth of town and country, the layout of roads and paths, the relationship between work and family, the formation of suitable public institutions, the kinds of public space required to support these institutions." Thus we find that the **Teen-Age Society** is #84 in the sequence.

"The balanced *Life Cycle* (26) requires that the transition from childhood to adulthood be treated by a far more subtle and embracing kind of teenage institution than a school. This pattern, which begins to define that institution, can take its place in the *Network of Learning* (18) and help contribute to the network of *Masters and Apprentices* (83)"

They write: "Just at the time when teenagers need to band together freely in groups of their own making and explore, step back from, and explore again, the adult world: its work, love, science, laws, habits, travel, play, communications, and governance, they get treated as if they were large children. They have no more responsibility or authority in a high school than the children in a kindergarten do...Under these circumstance, the adult forces which are forming in them, lash out, and wreak terrible vengeance. Blind adults can easily, then, call this vengeance "delinquency."

The authors believe that teenagers (between the ages of 12 to 18) should be encouraged to form a miniature society in which they are as differentiated, and as responsible mutually, as the adults in the full-scale adult society. It is necessary that they are responsible to one another, that they are able to play a useful role with respect to one another, that they have different degrees of power and authority according to their age and their maturity. Their society should be a microcosm of the adult society, **not an artificial society where people play at being adult, but the real thing, with real rewards, real tragedies, real work, real love, real friendship, real achievements, real responsibility.**

For this to happen it is necessary that each town have one or more actual teenage societies, partly enclosed, watched over, helped by adults, but run, essentially by adults and the teenagers together. This is the challenge of *The Design Way*.



Provide one central place which houses social functions, and a directory of classes in the community. Within the central place, provide communal eating for the students, opportunities for sports and games, a library and counseling for the network of learning which gives the students access to the classes, work communities, and home workshops that are scattered through the town_____

Pleasure of Finding Things Out

by Richard Feynman

Perseus Books, Cambridge, Mass. 1999, ISBN NO: 07382 0108-1.
Reviewed by Mary Duffield

How can I ever configure all of the facets of this gigantic diamond Richard Feynman? Facets of physics, mathematics, philosophy, fun? These are previously unpublished essays and speeches of the late Nobel Prize winner in Quantum Mechanics. Feynman contributed significantly to our winning the nuclear race during the cold war, and his unheeded advice to NASA probably would have prevented the tragedy of the space shuttle. ...And, lest you are bracing yourself for a brain strain, he illuminates his explanations by clowning, a genius-buffoon.

Let's quote a review of the book by fellow scientist Rocky Kolb. "He's always outrageous and courageous....a condition of intellectual giddiness, triggered by his words. These lectures are Feynman at his ideosyncratic best....wit, brilliance, and irreverence. The most celebrated scientist of our time. The more one reads, the more one falls in love with his refreshingly enthusiastic view of the universe. This is another set of his brilliant scientific sermons. Combining humanistic faith in the value of skepticism with religious awe for the beauty and power of the universe..."

".....here it is standing. Here am I standing ...atoms with consciousness... matter with curiosity... Stands at the sea...wonders at wondering.... I, a universe of atoms...an atom in the universe."

Pick yourself up off the floor, take a deep breath and know that this genius-buffoon also had his own jazz band...played the drums with a beat of 11 on one while steadily pounding a beat of 12 on the other. Then there's the time he had to hastily stuff the irradiated results of his lab's nuclear experiments into his backpack, ride a clumsy 1960-ish airplane...only to be booted off the plane.

And so, please, get this book NOW..... whilst I am still wondering wondrously at his appreciation that "the view from the shuttle was worth the weight of immortality."

You are invited to join the

Systems Thinking and Chaos Theory Network

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