Shifting our Mental Model – "Sustainability" to Regeneration

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Abstract

Sustainability, as currently practiced, is primarily an exercise in efficiency. In other words, through the use of BREEAM, LEED, and other rating systems we are attempting to slow down the damage caused by excessive resource use. We must do better. Instead of doing *less damage to* the environment, it is necessary to learn how we can *participate with* the environment – using the health of ecological systems as a basis for design. However, changing the way we interact with the earth's systems is difficult and is likely the greatest challenge we face. The shift from a fragmented worldview to a whole systems mental model is the significant leap our culture must make - framing and understanding living system interrelationships in an integrated way. A place based approach is one way to achieve this understanding. The design process begins by attempting to understand how the systems of life work in each unique place. Our role, as designers and stakeholders is to shift our relationship to one that creates a whole system of mutually beneficial relationships. By doing so, the potential for green design moves us beyond sustaining the environment to one that can regenerate its health – as well as our own.

Keywords: regeneration, place based design, human aspiration, nature, whole systems, spirit, evolution, co-evolution, mutually beneficial, learning levels, mental models

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INTRODUCTION

The Need for a New Mental Model

It is fair to say that we are in a situation where rapid change to a healthy relationship with the planet is in order. The concept of a Factor 10 society – reducing our ecological burden by 90% by 2050 to simply maintain fair access to the world's resources – and stabilizing global climate change – is unachievable at the rate of "improvement" we are making by means of incremental and fragmented efficiency. We will unlikely make the changes needed quickly enough unless we start doing some paradigm shifting.   A piecemeal, technological approach certainly opens the way. But more of the same type of incremental change is not really effective, especially at this stage our degrading practices. We need BIG changes and we need them FAST.

As Albert Einstein said, "Problems cannot be solved at the same level of awareness that created them." It's remarkable how often this quote is used in publications and presentations on sustainability. Yet we continue to attempt to achieve whatever it is we mean by the term sustainability with the same worldview, or mental model, that created the situation we find ourselves in – namely a fragmented and dominantly technical approach to address the health of the interrelated living systems we hope to sustain.

Scientists reduce the interactions of complex systems into a worthwhile but incomplete understanding of the elements that make the system healthy and functional. Medical doctors

treat cancer but fail to address the health of the whole patient. Society permits the sources of cancer to continue to be manufactured while paying the price for ineffective and incomplete healing. Architects and engineers address the efficiency of buildings while failing to understand the earth systems that are the very systems we are trying to sustain. Urban planers use formal design guidelines to pattern communities that are "alive" without understanding or addressing the health of the ecosystems that sustain and inform life in the place they are creating.

This fragmented worldview, which has dominated Western culture for several centuries, is the mechanistic or Cartesian model of the world that emerged out of the discoveries of the "Scientific Revolution" in the 16th and 17th centuries. "It replaced an image of a living, organic and spirit infused universe with the metaphor of the universe as a machine. Mind and matter were seen as wholly separate and independent. All that composed the universe of matter, including living organisms, were seen as machines composed of separate parts functioning according to specific and predictable laws of physics and chemistry." (Regenesis, 2003)

As a result, Western culture generally lives in a conceptual world of either/or logic and simplistic cause and effect thinking. We isolate, bifurcate, and package complex issues – humans and nature, science and religion, things and spirit – into those that can be analyzed by reduction and others into categories not easily quantified or impossible to measure. We separate understanding into realms of mind and heart, realism and idealism, logic and intuition, quantity and quality.

Our culture however is lagging far behind the new understandings being developed in our sciences. As evolutionary biologist Elizabet Sahtouris noted, "Western science is very rapidly changing toward an understanding of nature as alive, self-organizing, intelligent, conscious or sentient and participatory at all levels. In this newer framework biological evolution is holistic, intelligent and purposeful." (Sahtouris, 1999)

To understand how these overarching mental models influence us, imagine placing a highly concentrated red dye in a small stream and watching it flow into a larger stream to a larger river and finally into a large lake. There, though greatly diluted, it permeates the entire lake and all inhabitants of the lake now live in a delicately pink world. Furthermore, the lake remains color-tinged for a very long period of time after the original distant stream is cleared of dye.

Unlike the fish however, we humans can change the color or perspective through which we see our world. But it requires a conscious act of choice that begins with becoming aware of the way our current mental model colors what we see as real, how we think about ourselves and our world and how we therefore live, as well as how our future unfolds.

Scientific theories are models of reality that work much the same way in societies. By the time they have permeated the societal "lake" they color every aspect of how people think, the decisions they make and the actions they take. Yet people are usually no more aware of this influence than the fish in the lake. The more comprehensive the model, the more pervasive its ultimate social influence.

It is time to change our mental model to one that a) better reflects the new sciences' understanding of how our universe actually works, and (b) enables us to design, build and heal with the whole system in mind – a deeply integrated worldview.

Shifting Mental Models – "Change" is Difficult

Donella Meadows, in her article "Places to Intervene in a System" describes levels of effective ways to change systems. She states that the slowest way to change a system is with numbers. "Diddling with details, arranging the deck chairs on the Titanic. Probably ninety-five percent of our attention goes to numbers, but there's not a lot of power in them. Not that parameters aren't important--they can be . . . But they RARELY CHANGE BEHAVIOR." (her capitalization). Note that the typical green building discussion begins and often ends with a discussion of costs and quantitative benefits of a green approach. Many of the most quoted publications on green design relate to the financial benefits. The discussion is rarely about a new mental model, it is simply about addressing the status quo in a more efficient manner.

The fastest way to change a system occurs by changing the mental model or paradigm out of which the system arises. "You could say paradigms are harder to change than anything else about a system, and therefore this item should be lowest on the list, not the highest." Meadows writes in the same article, "But there's nothing physical or expensive or even slow about paradigm change. In a single individual it can happen in a millisecond. All it takes is a click in the mind, a new way of seeing. Of course individuals and societies do resist challenges to their paradigm harder than they resist any other kind of change." (Meadows, 1997)

The sustainability movement to this point has been remarkably ineffective at sustaining the small victories it has achieved. In the design and business world companies have made attempts in small groups and divisions to move these issues to the forefront of practice. However, systematic change has not been consistently realized. A few people try to lead the way and then, frustrated, coast along or move on to other opportunities. This can be seen with triple bottom line accounting in corporations or consistent achievement of LEED certified buildings in architectural firms. The change occurs in fits and starts, with only the exceptional firm or individual demonstrating the will to keep progressing. Even though a seeding process is occurring in the marketplace, it is not the type of worldview change we need. It is slow, fragmented, and insufficient. Changing our current mental model is the only way we can achieve the permanent and continuously evolving change – change to higher orders of thinking and understanding, that is required to reverse the damage resulting from our old mental model and "sustain sustainability".

This paper outlines the issues and need for a mental model shift and offers one process that can help move towards that shift and transform the way we think about and practice sustainability in the design and development field.

FOUNDATION FOR A NEW MENTAL MODEL:
WHOLE SYSTEMS AND LIVING SYSTEMS THINKING

The terms sustainability, ecology, green, restorative, regenerative, etc. mean different things to different people because of our predilection to isolate and fragment issues and look for simple cause and effect logic. One of the difficulties our culture has in defining sustainability is that people are looking for a definition of what "it" is. Our culture and language are so dominantly object oriented that we have a difficult time moving into a worldview that requires both quantitative and qualitative understanding - a world of interrelationships and processes of life, not simply "things". The nature of this broken perception is reflected in a comparison of language between two worldviews. "An Algonquin Indian . . . when he has to speak English instead of his MicMaq language says, 'he feels he is being forced to interact with a world of objects, things, rigid boundaries and categories in place of a more familiar world of flows, processes, activities, transformations and energies.'" (Sterling, 404)

The essence of sustainability is sustaining the conditions that enable life to flourish, to evolve and, as Tim Murphy of Regenesis describes it, to engage "in a riot of reciprocity". Achieving a sustainable condition requires us to engage with life on its own terms – as a living, evolving, interconnected, and mutually supportive enterprise. Sustainability is not a thing. Sustainability does not have an end point. It is not a static condition; it is a process – as life is a process. This process is not simply that of *doing things or doing fewer things to something* – a building, a community, etc. – to achieve a sustainable condition. As a culture we have that down pretty well; we are quite comfortable using technology, or political or economic mechanisms to leverage some benefit or another.

It is also necessary to learn how to *participate in partnership with the other systems* of life in a mutually beneficial dance of relationship building. This means engaging in a continuous, intentional process of understanding how life works for the benefit of all its aspects, creatures, and elements, and how we can engage with this system in an on going, healthy, evolving process. Sustainability is a progression toward a functional awareness that all things are connected; that the systems of commerce, building, society, geology, and nature are really one system of integrated relationships; that these systems are co-participants in the evolution of life.

This concept of sustainability moves us into thoughtful relationship with our life support systems. It opens the gates of communication with various sub-systems, hydrology, geology, plants, animals, and humans in a way that can move us from the condition of the disinterested observer toward awareness of the evolving linkages between all of these elements. The question is how we bring into common understanding the nature of these linkages and our ability to perceive, communicate, listen, and respond to this whole and integrated system.

> *"Our mental model of the way the world works must shift from images of a clockwork, machinelike universe that is fixed and determined, to the model of a universe that is open, dynamic, interconnected, and full of living qualities."*
> (Jaworski) *The paradigm shift from a dead to a living universe transforms the human story. We move from a secular journey in a fragmented and lifeless cosmos*

without apparent meaning or purpose, and into a sacred journey through a unified
and living universe whose purpose is to support the emergence of self-organizing
beings and communities at every scale. (Elgin)

Our current participation in this "unified and living universe" however is an unhealthy one. If we are to shift that, we must understand the nature of the change required of us.

The foundation for this evolution of understanding, and thereby of the way we participate, is whole or living systems thinking. In the design field we primarily see systems, and systems' thinking applied to closed systems such as mechanical systems, envelope systems and so on. These human designed systems are entropic by nature, requiring a continuous infusion of resources and energy to sustain themselves. *Whole systems thinking* recognizes that the entirety of existence is interconnected, and moves us beyond mechanics into a world that is activated by complex inter-relationships—natural systems, human social systems, and the conscious forces behind their actions. Everything is connected—in the act of building design we are inextricably engaged in direct and indirect reciprocal influence in the immediate community (place) and the planetary systems we are part of.

The green building movement, for the most part, has not been focused on or taken into account this interrelated wholeness. It has not even addressed the often referenced, basic, and fragmented system of sustainability's three-legged stool; a business view of sustainability – economic systems, natural systems, and social systems. Like our culture, we have primarily focused on technical and economic systems when designing, constructing and managing our human habitats.

As part of the fundamental change required of us, we need to include in our focus the prime resources and aspects of life that produce technologies and shelter, the basic foundations - earth systems and the people engaged with them - rather than simply the byproducts. Technical systems, of course, need to be understood, addressed, and measured. Engineered systems are not unimportant, they are simply insufficient.

Working with Living Systems.

In the emerging theory of living systems the process of life . . . autopoiesis, "self- making" . . . is identified with cognition, the process of knowing. This implies a radically new concept of mind, which is the most revolutionary and most exciting aspect of this theory, as it promised to overcome the Cartesion division between mind and matter.
According to the theory of living systems, mind is not a thing but a process - the very process of life. In other words, the organizing activity of living systems, at all levels of life, is mental activity. The interactions of a living organism – plant, animal, or human – with its environment are cognitive, or mental interactions. . . . (Capra, 172)

When we, as architects and engineers, begin to understand that the purpose of sustainability is sustaining life enhancing conditions, we begin to expand the breadth of our work to include living systems approaches. A living systems approach is based on the understanding that all things are alive and in a process of "becoming". In seeming contradiction to the second

law of thermodynamics – that all things increase in entropy to a state of maximum disorder – living systems self organize to increasing order and complex interrelationships. If life is a whole process of continuous evolution toward richer, more diverse, and mutually beneficial relationships, it seems logical that we ought to be working on sustainable design at that level.

Work as Learning

Most of us in our profession have been thoroughly indoctrinated in the mechanistic model. Our progression towards being able to work and live sustainably therefore requires new and more complete ways of knowing and learning.

British sustainable education pioneer Stephen Sterling uses Gregory Bateson's three levels of learning *(Steps to an Ecology of Mind)* to describe the nature of learning required for paradigm change." (Sterling, 128). Using the metaphor, "one can't see the forest for the trees" he depicts Learning I as only seeing the trees; Learning II might be stepping out and seeing the forest as a whole, recognizing its existence for the first time; Learning III might be the helicopter view, seeing fully that a number of alternative forests exist and may be chosen. (Sterling, 133)
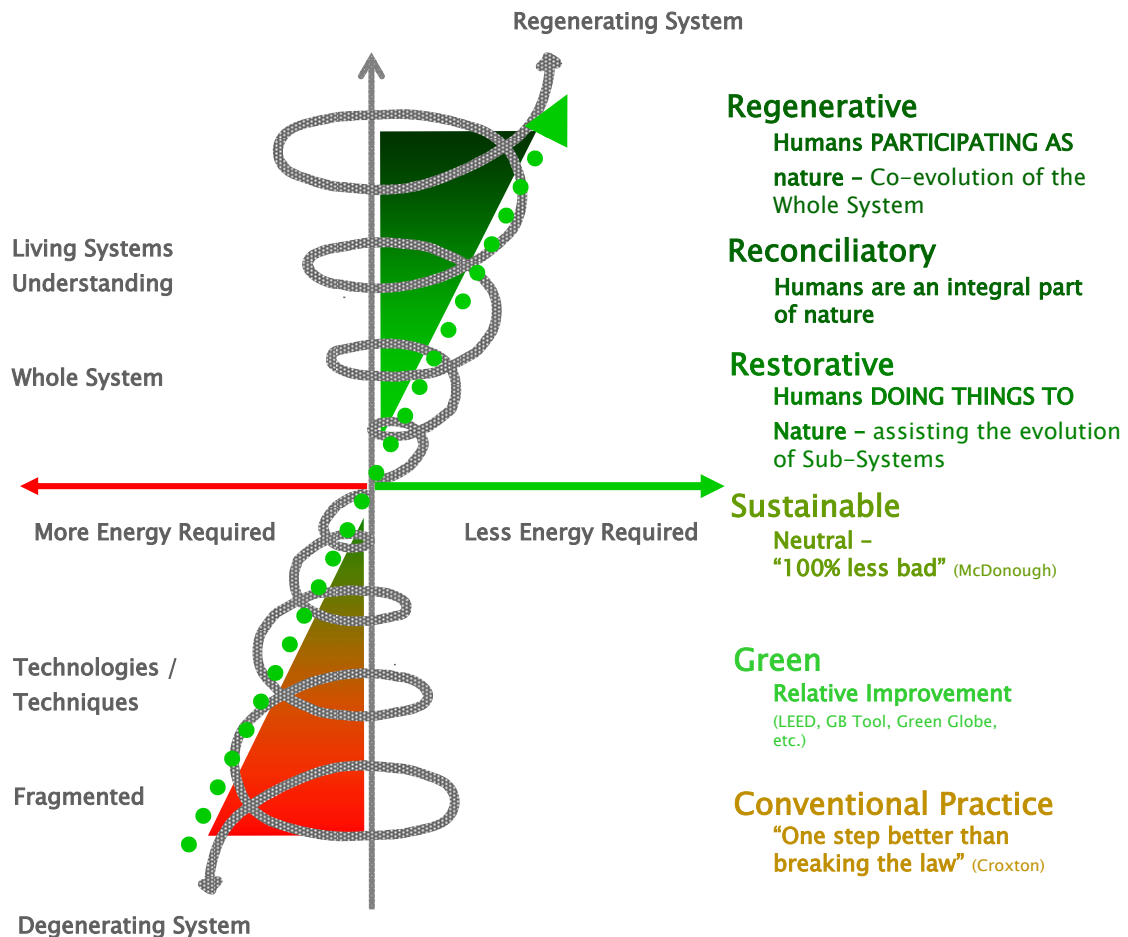
In relation to sustainability, Learning Level I is geared towards effectiveness and efficiency – 'doing things better', rather than 'doing better things' (and rather than, at a deeper level still, 'seeing things differently'). Watzlawick, Weakland and Fisch (Change, 50) make the distinction thus: "there are two different kinds of change: one that occurs within a given system which itself remains unchanged, and one whose occurrence changes the system itself." (Sterling, 134)

Peter Hawkins suggests that . . . Learning II alone is insufficient. Although it helps us move from 'efficiency thinking' at Learning I level towards 'effectiveness thinking' at Learning II, "it fails to address the fundamental question: effective for what, or to what end?" Learning III shifts our attention to the context of planetary survival, and the evolutionary need of what he calls 'integrative awareness'. Hence Learning III is associated with epistemological and perceptual change and a transpersonal/ transorganizational ethical and participative sensibility." (Sterling, 138)

This last point is worth some time. It is very important as it relates to the nature of understanding of the breadth of the whole system we are engaged in, and how we as a culture and planet might come to be in conscious, participatory relationship.

The following graphic and definitions indicate a trajectory of the practice of sustainability relating to the above. Learning I corresponds to the Greening level (efficiency). Learning II can be seen to align with the Sustainability level (effectiveness). Learning III addresses an evolving understanding of the Whole. The Reconciliation and Regeneration levels ask the question of our purpose here. What is the ultimate purpose of sustainability? For what are we being 'effective' and 'to what end'?

Trajectory of Environmentally Responsible Design

Regenerating System

Regenerative
Humans PARTICIPATING AS nature – Co-evolution of the Whole System

Reconciliatory
Humans are an integral part of nature

Restorative
Humans DOING THINGS TO Nature – assisting the evolution of Sub-Systems

Sustainable
Neutral –
"100% less bad" (McDonough)

Green
Relative Improvement
(LEED, GB Tool, Green Globe, etc.)

Conventional Practice
"One step better than breaking the law" (Croxton)

Living Systems Understanding

Whole System

More Energy Required

Less Energy Required

Technologies / Techniques

Fragmented

Degenerating System

Figure 1

(Explanatory Description of Figure 1)

ISSUE BASED APPROACHES (Fragmented – as currently practiced)

<u>Limiting the Damage</u>
- *High Performance Design* - Design that realizes high efficiency and reduced impact in the building structure, operations, and site activities. This term can imply a more technical efficiency approach to design and may limit an embrace of the larger natural system benefits.

<u>Neutral</u>
- *Green Design* - A general term implying a direction of improvement in design- i.e., continual improvement towards a generalized ideal of doing no harm - some people believe this is more applicable to buildings and technology.
- *Sustainable Design* - see "Green Design" with an emphasis on reaching a point of being able to sustain the health of the planet's organisms and systems over time.

LIVING SYSTEM APPROACHES (increasingly more Whole)

<u>Restoration</u>
- *Restorative Design* - This approach thinks about design in terms of using the activities of design and building to restore the capability of local natural systems to a healthy state of self organization.
- *Reconciliation Design* - This is a design process that acknowledges that humans are an integral part of nature and that human and natural systems are one.

<u>Regeneration</u>
- *Regenerative Design* - This is a design process that engages, and focuses on the evolution of the whole of the system of which we are part.   Logically, our place – community, watershed, and bio-region – is the sphere in which we can participate. By engaging all the key stakeholders and processes of the place – humans, other biotic systems, earth systems, and the consciousness that connects them – the design process builds the capability of people and the "more than human" participants to engage in continuous and healthy relationship through co-evolution. The design process draws from and supports continuous learning through feedback, reflection and dialogue, so that all aspects of the system are an integral part of the process of life in that place. Such processes tap into the consciousness and spirit of the people engaged in a place, the only way to sustain sustainability.

        Note that these levels of the sustainability trajectory are not exclusive of one another, they are a progression, and each is nested in the more whole level. All practice levels are necessary to achieve the change required.

Shifting to a new Worldview

        In general, our activities in LEED, BREEAM, triple bottom line indicators, and other systems of thought address generalized, planetary and regional issues. The missing aspect to achieving planetary health is how we specifically heal the damage we have caused and how we continue in healthy interrelationship with living systems.

        A healing process requires continual, thoughtful and caring engagement. We can best engage in healing in the places we inhabit. Our communities and land are where we can learn about what makes life possible on a continuing basis. Concurrently with our approaches to efficiency we need to become local biologists, ecologists, and community systems thinkers. Regeneration of the health of the humans and local earth systems is a two-way street – each supports the other in a mutually beneficial way. This awareness or consciousness of vital and viable interrelationship is the beginning of a whole system healing process.

Both planetary scale and place-based approaches are not mutually exclusive. It is not either/or, it is both/and.   The process of developing a regenerative relationship cannot abandon the efforts of large scale system approaches and the quantitative measurement of smaller scale systems that address planetary concerns – such as energy, persistent toxics, global warming. But the process of place-based engagement can frame and integrate these planetary issues in manageable, meaningful, and literally, grounded context (context, in Latin, contexere = to weave together).

To make this shift it is necessary to move from Learning Level I, doing the same things in a better way (efficiency) to Learning Levels II and III, which generate new levels of systemic understanding.

If the process of transformative change is the greatest barrier standing in the way of achieving a sustainable condition, it seems the aspect of "how one changes" should be of great interest to the design and building community. If we continue to try to justify green design from a perspective of cost savings and a better way to build, at the end of the day, we will still be operating from the same incremental and fragmented perspective that put us in this situation in the first place. Instead of hoping to sell the benefits of green building to clientele, co-consultants, the financial community, and approval agencies through cost/benefit discussions, first-principle logic, and force of will, we might find that our time us better used studying and integrating the organizational development technologies and processes that have shifted worldviews in businesses and the personal development field through introducing Level III learning processes.

There are many developmental approaches that can be utilized to help shift our culture to a whole systems understanding. Aggregating and refining these approaches is a field with great possible benefits for the sustainability movement. This is a topic for future study, symposia, and practice.

The following section gives an overview of a Learning Level III process – a regenerative approach to design. This approach requires a level of commitment from a client to break out of the conventional, linear design management process and reconsider the opportunity of design as an opportunity for learning. This co-learning process requires the design team to deeply engage, to participate, and to be conscious of the earth systems and human systems that are essential to the long term health of the place. In effect, the design and client team become a learning organization.

> *Learning involves . . . a movement of mind. Real learning gets to the heart of what it means to be human. Through learning we re-create ourselves. Through learning we become able to something we never were able to do. Through learning we reperceive the world and our relationship to it. Through learning we extend our capacity to create, to be part of the generative process of life.* (Senge, 13-14)

REALIZING REGENERATION
PRACTICING THE WHOLE - A LIVING SYSTEMS APPROACH TO DESIGN

Regeneration is a Learning Level III process – a deep search for the nature of relationship between human and earth systems that takes us into a new consciousness of care for the whole of the system we are part of – moving us from a worldview of "doing things TO nature" to one in which we participate as partners WITH and AS nature.

> *The idea that we live in something called "the environment" . . .is utterly preposterous. . . "Environment" means that which surrounds or encircles us; it means a world separate from ourselves, outside us. . . . The real state of things, of course, is far more complex and intimate and interesting than that. The world that environs us, that is around us, is also within us. We are made of it; we eat, drink, and breathe it . . . No settled family has ever called its home place an "environment" . . . The real names of the environment are the names of rivers and river valleys; creeks, ridges, and mountains; towns and cities; lakes, woodlands, lanes, roads, creatures, and people.* (Berry, 34)

Regeneration is not simply about making a landscape and local habitat more productive and healthy. Effective regeneration requires that we engage the entirety of what makes a place healthy – the core interrelationships between earth systems, humans, and the consciousness or spirit that connects them. This may be our home community, a corporate campus, a small lot, or a building. When one starts from a whole systems understanding, any of these entities is an entry point into the whole system. Each is an integral part of a living system and a key role can be found for anyone and any system within the smallest to largest physical footprint. The footprint is not the limiting factor as long as a sense of conscious engagement can be realized by the people who are part of it.

Aspects of a Regenerative Approach to Design

There are three essential aspects to catalyzing a regenerative condition. These are not necessarily steps but more like an evolutionary spiral because the process continually evolves in a gradual unfolding or emergence as the field changes. The process needs to intentionally continue long after the design leads and consultants are gone. If not, the relationships that have been established can be forgotten and the potential for new, healthier, and more vital relationships left undiscovered.

The three aspects are:

1 – Understanding the Master Pattern of Place

2 – Translate the patterns into design guidelines and conceptual design

3 – Ongoing Feedback – a conscious process of learning and participation through action, reflection and dialogue

Referencing the Peter Hawkins statement about the shift in integrative awareness at Learning Level III, these three aspects of catalyzing a regenerative approach are generalized activities on a continuous process spiral. The feedback process is one of "reflective activism", iterating with each cycle of action to inform greater understanding of the Master Patterns of the Place, responsive to the continually evolving and shifting field. A community of stakeholders functioning and "being" at this level of learning experience a worldview shift through a perceptual process of "understanding their understanding" (epistemological). They and the group they are part of experience a deeper level of communication that transcends the boundaries of the individual self and interest groups in doing so (transpersonal and transorganizational). David Bohm writes about this process as an outcome of true dialogue. It is this fundamental shift in mental model that the process of regeneration needs to elicit or the design process will likely not realize a systemic shift in the participants and the Place of which they are part.

1   Understanding the Master Pattern of Place

The first task in the process is to determine the most appropriate health-generating pattern of relationships for a particular project in its place.

Task one requires that the team develop understanding in two areas: the human aspirations the project hopes to realize and an essence, or core, understanding of the unique character of the place the project seeks to inhabit. A 'Core' or 'essence' understanding helps us understand the essential role this place plays in the health of the ecosystem as a whole. This level of understanding is in contrast to conventional planning and design. Conventional processes start with gathering discrete packets of knowledge from experts in water, energy, soils, etc. Without an integrative systemic context, such knowledge can be both fragmenting and misleading.

1a Setting the Stage – understanding and aligning human aspirations of a project

To understand the objectives of a project, it is necessary to understand the core drivers of why the project is proposed in the first place and what people value and perceive as significant about the Place they inhabit. It is necessary to elicit from the participants the aspirations they have about this project and locale. Questions about what is driving this project, what is important to the client and design team are elicited in a group dialogue. It is significant to note the difference between the "vision" and "aspiration".

- A vision, as it is used in planning processes today, is basically a wish list of desirable features or wants by the project constituents. These "visions" may amount to dozens of multi-paged flip chart lists. Often there are contradictory issues that cause more disagreement among participants than alignment around a purpose.

- An aspiration is a deeper, heartfelt purpose (aspire, breathe, spirit) that, if elicited in the course of the design process, becomes a fundamental aim of the project expressed in qualitative and process terms. This mode of expression gives the design process flexibility and the energy to find solutions that support both the aspirations and the nature of the place. The aspirations open up the possibilities of rich and fruitful

dialogue with the participants as opposed to laundry lists that fragment and pit sides against each other.

With the fundamental or core aim understood by the participants the way is open to begin exploring how this aim, and its underlying aspirations, can be met within the opportunities and limits of the nature of the Place.

This process is useful for three reasons. First, by eliciting the core aim or purpose of the project, the many members of the client and design team have the opportunity to see beyond the simple building program and question assumptions. Second, this has the potential of better aligning the design team around the purpose of their work. Finally, it is a source of new creativity and spirit. Working on unique projects in unique places requires that design teams break out of past practice patterns and expectations to realize unique solutions. Only with this nature of process is it likely they will realize the deepest potential of a whole system solution.

1b Learning about the Place

In order to address the health of an ecosystem and our role in it – how our aspirations can support and be supported by the system - we need to understand how it works and why—the historic and present patterns of human and earth system interrelationship. By understanding the patterns of evolution and health in a watershed, the relationships between the systems (human, plant, animal, hydrology, meteorology, geology) can be understood with a good level of approximation. When did life express itself more fully than other times; why; what occurred to change these relationships; and so on?

This understanding of the whole as a coherent, evolving living system gives us the opportunity to identify the key sub-systems and keystone species in a place that made it work more effectively in the past and may provide new opportunities in the future – particularly in alignment with current aspirations of the people in that place.

Regenesis, in a paper on regeneration in development, notes that "Careful reading of the landscape of place (biotic and cultural) enables us to develop mental maps of the leverage points, those key intersections where small interventions can energize the system as a whole. The aim is to ensure that the considerable investment represented by development yields more than just physical stuff (which, being subject to entropy, immediately begins to deteriorate). It also initiates ongoing processes that continue to work to realize the full potential of place, and does so in a way that enables greater and greater spheres of influence. This requires a firm grounding in the specifics of the place, and how that place is nested in, and influences and interacts with larger wholes. The essential guiding questions are: "What wants to emerge out of the integration of this project and this place? Therefore, who are we required to be and how do we become that?" (Regenesis, 2005)

1c Developing the story of place

By expressing these relationships in the form of a "story of place" it is possible to more quickly engage the layperson in an understanding of the complex relationships in an ecosystem and their role within it. It functions as a metaphor to quickly and powerfully communicate these ideas.

The story of place as a context serves multiple purposes.

First, history has shown that we will not sustain the will needed to make and maintain the needed changes, day after day, without evoking the spirit of caring that comes from a deep connection to place. "One of the biggest sources of hazard for the sustainability movement is that we still have not figured out how to sustain sustainability. The landscape is littered with wonderful projects that got started with full energy and lots of expertise and over time they gradually drifted into monotony and the spirit went out of them. How do we create the kind of spirit around our work that taps into a powerful enough source of caring that we can continue it and continuously regenerate it? How do we really tap into the wisdom that local cultures embody to work more effectively on the restoration projects, the development projects, etc…Place is intimate, personal, filled with meaning and potential. It grows out of the rich interrelationship of earth energies, biotic energies, and human cultural energies to create a living whole with its own distinctive nature and spirit. When we experience where we live and work as such a place, it becomes a powerful source for the continuing caring required to sustain sustainability." (Biohabitats, Inc., Leaflitter, April 2006)

Second, discovering the story of a place enables us to understand how living systems work in a particular place, and enables us to bring greater intelligence to how humans can then align themselves with that way of working to the benefit of both.

Third, the story of place provides an integrative context that helps maintain the spirit and vitality of holding a collective and meaningful purpose.

Finally, the story of place provides a framework for an ongoing learning process that enables humans to co-evolve with their environment.

2 Design Framework / Guidelines and Conceptual Design

Once the desired "master pattern" of relationship is defined, the second task is to translate it into a conceptual design and a set of design guidelines. This serves as the framework or container for decisions made in the subsequent stages—design, selection of appropriate green materials and technologies, construction, operations, and long term operation and maintenance.

Task two is usually accomplished through conceptual design charettes (or workshops). In the design charettes, the client and the design team draw on the insights and understanding developed out of the first phase of work to collectively generate a development concept that integrates human needs and aspirations in a reciprocally beneficial relationship with the living systems of the site and surrounding contexts.

2a Marrying story of place with aspirations for future

This is the point where conceptual design can begin. Building on the foundation established, the design team can respond to real issues of the environment and the aspirations of the people in relation to the opportunities in and natural limits of the place as a living system. This stage requires significant dialogue. Through truly listening and learning, we can collectively change our worldview. We shift into Learning Levels II and III and reconceptualize our place in <u>this</u> place and the world.

At this point it is essential to form a Core Team to hold the aspirations in relation to the health of the place and project. This team's responsibility is not in day-to-day activities but to remember, hold, and promote the core aim and higher aspirations of the project – to hold the core which energizes the design process and on-going resiliency of the Place.

The work of the Core Team is essential to realize a regenerative process. Without a team holding the aspirations and understanding of the place, the process will revert back to old patterns. Since building and planning projects require teams composed of many individuals, the willingness to change mental models to a larger and more systemic field becomes a critical success factor. The Core Team becomes a key player in enabling this change. When the initial design team disbands, remaining key participants will need to sustain and evolve the thinking and feedback process into the future.

The work of Jaime Lerner and his associates in the City of Curitiba is a notable example of this type of core team process. Many, including the United Nations, have lauded the city of Curitiba as now being a leading model for ecological urban development and planning. Fundamental to all of these changes in Curitiba is the change that has taken place in the culture itself, one of the distinct aspects of the process that shifted this city from a poor and moribund place to a thriving city–. In a survey conducted in the 1990's, over 99 percent of Curitibans told pollsters that if they could choose anywhere in the world to live, they would choose Curitiba. This contrasts with similar polls conducted in New York City, in which 60 percent said they would rather live somewhere else, and in Sao Paulo, in which 70 percent said they would rather live in Curitiba. (cited in McKibben, 1995 by Mang, 2005)

A very distinct aspect of Jaime Lerner and his associates' approach to city planning is their unique work process. Half of each workday, Lerner and his associates retreat to his log cabin on the grounds of a city park. There, they talk "big ideas that might change many lives" (Peirce, 2000, p. 2). Then, in the second half of the day, they return to their official offices to meet their constituents and to deal with the city's day-to-day needs. According to Lerner their work demands a continuous balancing between visionary ideas and day-to-day needs. (Mang, 2005)

The work of the Core Team is essential to carry this work forward and keep it from fragmenting in the general melee of the design and construction process. Core teams, just like people, require a developmental process. It is interesting that the concept of human development work seems essential to engage when attempting to shift into a whole system approach. The most successful projects we have seen were projects in which the client had

already made this worldview leap or were working on their own personal development. IN other words, to engage in a project requiring deep change seems to require the engagement of people who are willing to go through a change process themselves. Such a developmental process for a Core Team usually requires a long term engagement with a large building project. For smaller design projects, when the process may not allow the time to establish the trust and dialogue of an effective team, greater success may be had by utilizing a team that already has integration experience and been through a process of team development.

2b Identify indicators

Once the desired patterns of relationships, and keystone species and key systems are generally understood, metrics and benchmarks to measure levels of improvement can be established. No one can be sure that the understanding of the ecosystem is correct or that the people engaged with the system will interact in the assumed way. Monitoring the work is essential to receive the feedback necessary to allow a system (human and earth systems) to evolve. The feedback process supports the development of conscious engagement and deeper relationship between people and place as time moves on.

2c Integrative Design/Construction Process

All the design work should support the establishment of the health of the whole as well as other non-conflicting or at a minimum, neutral to the system, objectives. The process of optimizing each system and part in relation to the whole requires more than a few iterations of thinking. Since we work within the framework of time – a linear process – we need to approximate the simultaneity of the whole by rapid and frequent iteration of ideas. This is the basic process of Integrative Design.

3   Create a Process of Conscious Learning and Participation - Ongoing Feedback

Continuous monitoring and measurement also involves engaging the "community" as participants as the place evolves. This is practically achieved through an on-going Core Team that holds the long term aspirations for the project/community, and supports and facilitates the iterative cycles of action, reflection, dialogue as a means of deepening place connections and growing understanding and mutual caring.

To make this manageable, the focus should be the place they inhabit. As the physicist David Bohm says in his book, *On Dialogue*, "There is no way by which thought can hold the whole, because thought only abstracts; it limits and defines. . . . the alternative way toward understanding a whole arises through participation rather than abstraction." (Bohm, p. xii, xiii, xix, 4) *"The power of abstract thinking has led us to treat the natural environment – the web of life – as if it consisted of separate parts, to be exploited by different interest groups. . . . To regain our full humanity, we have to regain our experience of connectedness with the entire web of life. This reconnecting, religio in Latin, is the very essence of the spiritual grounding of deep ecology."* (Capra, 296)

CONCLUSION

It is the conscious activity of being in relationship to each other that will help us achieve the shift in our mental model that enables an approach to design and life that regenerates us and the places we inhabit. It is difficult to imagine we will achieve even a modicum of a sustainable condition without this conscious and collaborative approach. A concept that typically upsets environmental warriors is the idea that "development" can be healing. In fact, it must be healing or we will likely not move ourselves out of the ecological predicament we find ourselves in. Developers and development projects will find opportunities to harmonize systems instead of minimally damage them. This is an agenda that stakeholders, once they are introduced to the feasibility of such a vision, will support. It is through the development of relationships of all the entities in a place that this concept can be realized.

By seeing the ultimate aim of all our work as the regeneration and evolution of increasingly vital, viable and inspiriting places, we can reverse this loss (of our places). The good work we can do needs to be done in place, where we can experience ourselves as being connected with and relevant to the natural and social world in which we live, as playing a meaningful role as co-creators. (Leaf Litter, 2006)

This way of working can deliver not only more holistic and effective projects, it can also deliver a higher level of satisfaction. We experience ourselves as part of a larger whole. We are increasingly able to play a meaningful role, one that evolves us at the same time that it evolves the living communities we are an integral part of. Inevitably this results in a deep sense of caring, appreciation, connectedness for all who choose to engage in a regenerative level of work.

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ILLUSTRATIONS

Figure 1: Trajectory of Environmental Design Approaches