

Eco-Restorative Design: Beyond Sustainability - An Evolutionary Process Toward Care for the Greater Community of Life

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Preamble to the International Earth Charter

We stand at a critical moment in earth's history, a time when humanity must choose its future. As the world becomes increasingly interdependent and fragile, the future at once holds great peril and great promise. To move forward we must recognize that in the midst of a magnificent diversity of cultures and life forms, we are one human family and one Earth community with a common destiny. We must join together to bring forth a sustainable global society founded on respect for nature, universal human rights, economic justice, and a culture of peace. Towards this end, it is imperative that we, the peoples of earth, declare our responsibility to one another, to the greater community of life, and to future generations.

Prologue – “Spirit of the EcoRestorative Movement”

*And God blessed them, and said unto them, “Be fruitful, and multiply, and **replenish** the earth, and subdue it, and have dominion over the fish of the sea, and over the fowl of the air, and over every living thing that moveth upon the earth.” (Gen. 1:28)*

Personal Introduction

While pushing wheelbarrows on the reclamation project known as Fifth City on Chicago’s West side, fascination for designing buildings first stirred my early adult life. Working at the former Institute of Cultural Affairs seminary campus found me hauling broken bricks and century old row house debris during the hottest days of 1963. I remember our talks in the shade of the old seminary dining hall. We brainstormed about how bricks and mortar would help set the stage for reshaping human community for poor black people. But while sitting in the cool shade it never occurred to me: using bricks and mortar also changes the natural world, for better or worse.

Ensuing studies at Rice University birthed in me a reverent regard for Ian McHarg’s ideas, who authored his landmark book Design with Nature in 1969. Ian’s ideas sparked our graduate class toward the integration of human activity and care for the natural environment. Such ideas caused me to rethink how best to apply my Master of Urban Design degree through the application of sustainable, ecologically responsible design.

In June 1993 I again found myself back in Chicago. There, while participating in launching the first international architectural convention, we formulated a global “Declaration of Interdependence for a Sustainable Future.” My life and architectural practice was transformed. Since that time I have sought out a way to “build the Earth” through the use of sustainable design ideas. The seeds of the *eco-restorative movement* ideas I will offer today germinated in Chicago.

The insights gained in those earlier years blossomed when I read Father Thomas Berry’s The Dream of the Earth. His visionary grasp of humanity’s relationship with Earth helped me see how human perception about the natural world is fundamentally shaping our time in history with the passing of each day. He foresaw our rush toward a new era wherein the natural world will seem to have turned the tables against us. He envisioned the natural world regaining the reverent

attention once deemed so worthy by our ancestors. He also understood the human community would finally have to come to grips with the visceral prospect of its own extinction.

Overview – Our challenge for the 21st century

Nine years ago representatives from 175 nation states, including the United States, concluded in the preamble to the international Earth Charter:

“We stand at a critical moment in earth's history, a time when humanity must choose its future.”

How transformative can this simple line be in our lives?

Before beginning, let each one of us first consider our sense of commitment to this preamble.

Let us collectively determine a course of action on this day that acknowledges the Earth Charter preamble:

“Our greatest challenge of the 21st century is to allow all future generations the right to life, and the right to participate in life processes equal in quality to that of our own time.”

On October 24, 2009 people in 181 countries came together for the most widespread day of environmental action in the planet's history. Although not given attention in the U.S. media, throughout the world this grassroots inspired event is now known as “350.” Millions are aware that the earth's CO² count has exceeded the scientific community's recommended threshold of 350 parts per million. People in all walks of life and different faiths are calling for action because they have come to believe the climate crisis is being affected by increasing levels of CO². The global “350” event is clear evidence for us all to witness. It proved we are capable of taking action locally and transforming political agendas globally. Because of this event, the world is a different place today. Through witnessing the 350 event, we see the power of human spirit at its best.

Global warming is heating up the sustainability movement. Many say the green revolution is being driven by climate change. What we see in these two terms is an evolution of thought. Today sustainable concepts have taken the architectural design profession beyond the boundaries of its previous notions about “green architecture.” What we are to consider here is a look down the road toward future architectural and urban design. Down that road we will encounter *eco-restorative design*. Sustainable design looks at creating built environment in ways that sustain future generations ability to live their lives at a level of quality equal to that of our own. Eco-restorative design looks at how we can go about creating built environment in ways that sustain the future prospects of all communities of life, not just the human community. The promise of a better future for all children is better served when we ask the question, “what equitable balance can be formed so both people and all other life can thrive?”

Eco-restorative design is inspired by climate change and degradation of Earth's ecosystems. Eco-restorative design can be seen as an evolution of sustainable design philosophy. What eco-restorative design adds to sustainable design thinking is its attention to the greater community of life. Eco-restorative design helps design how every interested person can play a role in restoring the Earth to its indigenous level of fecundity. That is to say eco-restorative design helps design and redesign buildings that nurture local ecosystems ability to flourish and increase biomass. It is a daunting challenge. If it is not met, the scientific community generally agrees the survival of countless species, as well as our own, is at risk.

“Climate change is a reality. Life depends on a sustainable environment. With no world, there can only be nothing--no birds, no animals, no trees, no us. That's why getting involved in 350.org is so important--it's an effective way to take action to turn around the climate crisis.” --

Archbishop Desmond Tutu

From Moscow to “350”

Toward the end of his stellar career of service to the scientific and educational communities, Dr. Carl Sagan traveled with 22 globally renowned scientists to Moscow in 1990. There representatives from 83 countries attended the Global Forum of Spiritual and Parliamentary Leaders on Human Survival. Their statement listed the dangers of global warming, the depletion of food resources, the extinction of plant and animal species, and the destruction of rain forests, among other topics. According to the *New York Times* report, this Global Forum determined: *“Problems of such magnitude, and solutions demanding so broad a perspective, must be recognized from the outset as having a religious as well as a scientific dimension.”*

It is within this context we consider our global challenge. This is a time crying for “out of the box” thinking. It is a story searching for human reconnection to our sacred bond with Earth. And it is a story that involves the participation of lots of people. So let us consider where most people live: cities.

Of all the environments to be found on Earth, the most diversified human cultural environments are to be found in cities. Contrasting this, urbanized land is in most dire need of reclamation, soil rejuvenation, and natural ecosystems restoration. Cities comprise man-made environments severely disconnected from natural processes.

The combination of disenfranchised people living in cities immersed in ecological distress sets the stage for eco-restorative design. Some of us are looking towards staging a future *Re-greening of America* revolution. It is time to step upon that green stage to champion the future needs of millions of people. Aided by the educational community’s example, the youth of inner city America can be helped to see for themselves the promise of a new green world drawing their enthusiastic participation. The Re-greening America approach is about applying appropriate technologies to render our streets, vacant lots, and roof tops as contributors to the restoration of our planet’s ecosystem.

“Anything else you're interested in is not going to happen if you can't breathe the air and drink the water. Don't sit this one out. Do something.”

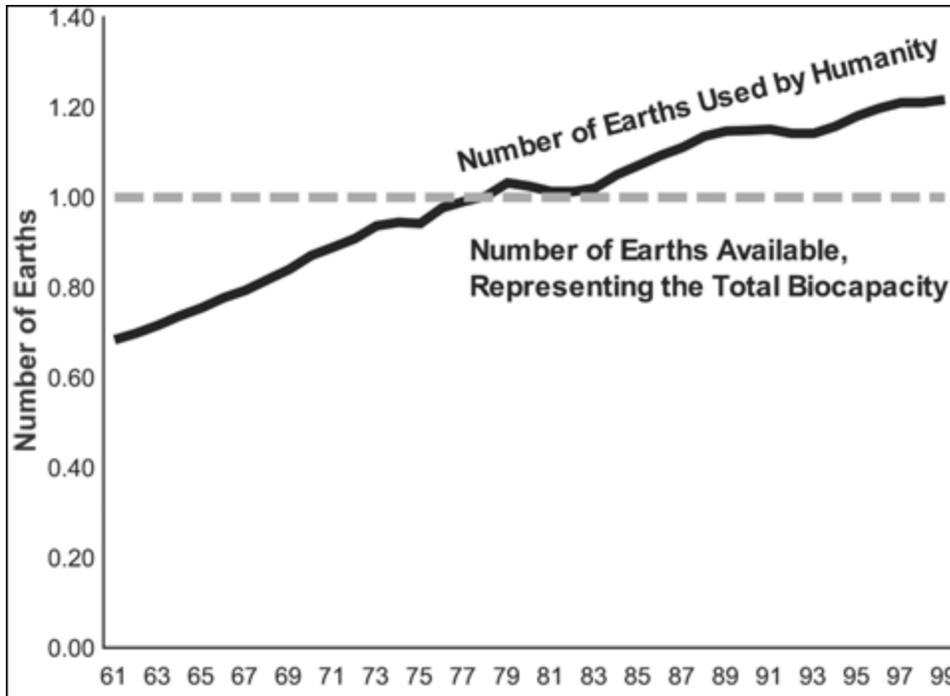
Dr. Carl Sagan

The Great Shift

What is driving the great shift from an anthropocentrically-dominated world toward a perceived interdependent and humane relationship between people and the natural world?

Most of us are aware of the previously mentioned challenges and their attendant social and economic inequities. These challenges belie the decline of Earth’s natural bio-capacity upon which humankind ultimately depends. The human community now consumes 40 percent of all currently available food-based energy resources on Earth. That is to say that within the aegis of horticultural and naturally occurring biomass processes, humanity is consuming almost half of what is available to all species of life. This onslaught is accelerating in the face of a shrinking global biomass dinner table. For example, recently global food reserves sank to a 61-day supply – an all-time low. Information from the National Academy of Sciences shows us this:

This overdraw and erosion of our planet’s capacity to support life is pressing the human community to adopt measures intended to slow, and ultimately overcome, the growing decline of Earth’s carrying capacity. The weight of human intervention into the natural world is compelling us to convene, to reassess, to pay attention--however inconvenient or economically compromising sustainable-use policies might seem.



Even in the architectural world, a shift from anthropocentric bottom line ethics towards addressing the larger Earth community is taking place. As far back as 1992, *The Hannover Principles* were developed as foundational guidelines for ecological design. One of the key principles listed for dissemination at the 2000 Hannover World Fair:

“Respect relationships between spirit and matter.”

This acknowledgement of spirit living in and being expressed through the physical world marks the emergence of a great awakening in the western world’s perception about nature in industrial/technological societies.

The Hannover Principles helped usher in a New Earth Story compelling us to consider joining forces with all life communities. In so doing they embraced the worlds of spirit and matter as being integral with one another. Here we see people representing building sciences and design services willing to acknowledge the presence of Spirit as an integral part of the ecological design process!

Technological Mindset - Our Last Great Hope?

Central to the challenges of our time resides western culture’s last great hope: technology. Many people living in industrialized societies are accustomed to believe science will continue to pull the proverbial “white rabbit out of the hat.” Our insistence on individual freedom and our inherited pride in seeing technology as the instrument for the control of nature underlies our wish to continue our reliance on technology to avoid catastrophe. We continue to think in terms of inventing new technologies that will enable us to produce more food, more inventions, and more clever fixes. But so far application of new technologies has failed to reverse Earth’s ecological decline.

Consumerism, global investment practices, social inequity, and slow progression towards emancipation of gender, of poverty, and of human rights have added their contributions towards environmental meltdown. If developing countries were to adopt America’s level of consumerism, it would take almost six planet Earth’s to match the western world’s narcissistic appetite (see above National Academy of Sciences graph).

However, in the midst of our love affair with technology, enough danger signals have occurred to cause a growing number of us to reconsider the march down our technocratic road. For example, according to the World Wide Fund for Nature, glacier melt is now predicted to severely affect the lives of two billion people when Himalayan glaciers completely disappear within the next thirty-five years (see Appendix). One of many global warming implications resulting from Greenland's alarming ice melt (scientists are saying it is melting much faster than previously believed) will see Bangladesh inundated with sea rise level covering almost half its land area. Whole Micronesian populations are at risk. Lower lying coastal areas, particularly in Louisiana, Florida, and the North Carolina outer banks will be affected in the United States. The scientific community has reached consensus on human generated CO² impacting and even accelerating this global warming process. Within the context of the global community, we are faced with the moral question of participating in this impending tragic ending of so many human lives.

Let us take a look at a sampling of our last great hope: new technologies which many people believe will eventually help turn the global warming tide.

-- **Thin film and applied photovoltaic coatings** which can transform roofing and building siding into solar energy collectors.

-- **"Phase change" adjuncts to traditional wall and ceiling insulation** products which reduce ranges of temperature variations in buildings.

-- **Precast concrete foundation cisterns** that are designed to store rainwater, structurally support buildings, and add malleable thermal mass to buildings.

-- **Biodegradable packaging materials** and related products which can be used as natural fertilizer inputs in China.

-- **Recycled and reused materials in manufacturing** can be seen in Ford's demonstration "Model U" automotive design process, which eliminates waste streams coming from manufacturing. It demonstrates a recycling process generally known as "biotechnological food resources."

-- **LED lighting** luminaries which use a fraction of the energy used by fluorescent lamps (fluorescent technology uses mercury and therefore is a waste hazard).

-- **Aero phonic crop rooftop production** is being developed in Pacific Rim countries with the objective of creating urban farming industries on top of buildings having flat roofs (presages use of urbanized areas as food resources for people).

-- **Renewable fuel resources** intended to serve reciprocating engine technology will move from use of precious food stocks (like corn) to algae propagation which can generate doubled biomass production every 24 hours.

-- **Fusion energy production** may become available within the next twenty years (this timeframe is too far into the future to significantly affect CO² emission reductions needed to neutralize greenhouse gas propagation in time).

Another landmark development is the new "high performance" building certification process now being used in the United States. Governmental and educational facilities are adopting the use of a new building design and construction certification process known as Leadership in Energy and Environmental Design (LEED). Architects and people associated with the design services industry are using LEED guidelines to help them develop sustainable buildings and related site improvements. The incorporation of these sustainable design criteria is intended to reduce energy and resource consumption, which in turn helps reduce CO² emissions.

All these are wonderful developments. But they are not enough.

Within the next ten to twenty years, "LEED – New Construction" buildings will affect roughly 2 percent of America's building stock. But what about all the existing structures whose thermal performance pales in comparison to these high performance buildings? And what about the

economics involved in retrofitting the new technologies listed above? Using LEED guidelines will take more time than is left for us to transform our inventory of extractive use buildings into net energy exporting buildings. In the face of this situation, what can be done to bring America in line with average worldwide energy use patterns?

Photovoltaic electrical generation, solar water heating arrays, wind generated electricity, and associated renewable energy technologies are promising a better tomorrow in the minds of most people. Such technological applications are very important to our future. They are indeed part of the solution to global warming. However at this time in history they pose an important drawback. These sophisticated delivery systems require a high degree of specialization, centralized distribution patterns, and highly skilled labor resources to produce, install, and maintain them. Access to such technologies tends to be limited in many parts of the world. When these options are entertained in so-called third world nations, they can be seen as “hard technology.” They can be viewed as such because they are difficult to acquire and bring on-line in most underdeveloped locations around the world – including inner city America. What is needed to counterbalance the relative unavailability of these hard technologies are sustainable scientifically based globally applicable processes which can be referred to as “soft technologies.”

Soft Technologies – Our New Partner with Hard Technology

Resolution of climate change is a global enterprise. This challenge will command the attention and participation of every empowered man, woman, and child on the planet. The application of hard technology is, unfortunately, reserved for the fortunate few who have access to deep-pocketed economic and highly specialized industrialized resources. Enter “soft technologies.” “Soft technology” is about using locally available human and physical resources as we find them. It is about applying a combination of ancient and contemporary sciences. This “soft tech” process draws upon a utilitarian knowledge base termed Agrarian Earth Science. The general application of Agrarian Earth Science was popularized in the western world by a man named Bill Mollison in the 1980s. He and his partner in Australia developed nature-based ways for people to interact with surrounding ecosystems. Part of his inspiration drew upon ancient technologies developed by indigenous peoples. Mollison saw it was possible for humans to live in harmony with nature. He coined the word “permaculture” to identify this contemporary cultural form of living lightly on the land. Today one can find examples of whole communities whose interactions with nature are based on “permaculture,” “Natueco,” and related Agrarian Earth Sciences throughout the world.

Soft technologies involve processes that are decentralized and available to people everywhere in the world. Such technologies combine ancient agrarian sciences with contemporary Agrarian Earth Science. Through the test of at least forty centuries these processes have proven to be truly sustainable. Numerous examples involving the application of soft technologies can be found wherein entire communities of people participate in their long-term horticultural operations.

Today similar Agrarian Earth Science based modalities are needed to complement the use of hard technologies. Perhaps the greatest advantage of this blending of old and new has to do with the fact that unskilled human resources can be called upon to put Agrarian Earth Science to use. Contrasting the use of “hard tech” which is costly and inaccessible to many people throughout the world, application of “permaculture” based sustainable crop production can be universally adopted.

Here is the unaddressed opportunity of our time: combinations of hard and soft technologies can be used in cities and human habitations throughout the world to address climate change.

Cities are our beachhead landing ground. The combined use of these technologies will permit people from all walks of life to participate, whatever their education and socio-economic background.

Universal human participation is key to meaningful global ecological transformation. The environmental challenges of our time can be successfully met; however, not by the few and not alone by those whose resources seem up to the challenge. As was the case on December 7, 1941, almost every able-bodied adult in America and in other countries joined forces to “do their bit” to win the war. So too, we must enlist and galvanize all members of our society to participate in winning this greatest global challenge in mankind’s history. This combination of hard and soft technologies provides the means whereby every engaged person can “do their bit.”

Innovative Visions for the Future

Nowhere in the world of human-built environment has there been a greater need to embrace these new ideas than in cities. Nowhere in the world are there more opportunities to adopt and apply eco-restorative processes than in urbanized localities.

Local economic flows: This process begins with people and the decentralized economic activity patterns they can generate. The key barometer for local exchange and flow of commerce is money distributed within local neighborhoods and communities like Fifth City in Chicago. When compared to the energy-intensive centralized corporate world, such economies are less energy consumptive and, therefore, healthier for the planet. Throughout America, small businesses, urban farming and hundreds of thousands of individuals participating in the Re-Greening of America can create a totally new fabric of life in cities.

Corporate-based services encourage the concentration and flow of money outside most urban areas. In contrast, mixed-use zoning, farmers markets and individually owned corner grocery stores are among many examples involving localized economic exchanges. A national organization known as Business Alliance for Local Living Economies (BALLE) supports and encourages the development of neighborhood- scaled commerce using these methods. The energy needed to produce and transport locally grown produce is significantly less than needed for agribusiness-produced imports from California. Localized economies offer social benefits as well. Human accountability is one of these. Local producers often have direct contact with their end-use customers, so the incentive to produce higher quality is more immediate. In the world of localized thinking, economics is just one factor. Locally derived recycled water flows, energy flows, and mixed-use zoning in cities can all be associated with the BALLE concept.

Retrofitting and adaptive reuse: What about our existing building infrastructure? In most cities about 80 percent of the building stock that exists today will likely be occupied by successor generations of people. However progressive new construction sustainable design polices like the previously mentioned LEED program may be, the construction of new buildings will be far overshadowed by the urgent need to retrofit sustainable practice technologies into existing buildings, streets, and parking lots. This process is known as “adaptive reuse”. It is evident everywhere in older urban centers throughout America. The retrofitting of insulation, weather-stripping, and rainwater distribution system can be applied to most buildings. Opportunities for creation of community gardens and green spaces abound.

Making imaginative use of existing-building stock is an exciting venture. For instance, excellent examples of adaptive reuse can be found in Durham, North Carolina. The downtown area of this city is dominated by brick warehouses and manufacturing facilities built by the tobacco industry over a century ago. Today these fine buildings have been adapted for condominiums and apartments which are in high demand.

Within the urbanized world we have the opportunity to transform how human populations will retrofit soft technologies into streets and buildings everywhere. We are envisioning an evolutionary green revolution leading us towards humankind's regained synergistic relationship with the natural world in cities. This transformative vision forms the heartbeat of the future eco-restorative green movement.

Social and Environmental Equity: Celebrating the 75th anniversary of the Civilian Conservation Corps initiated during the 1930s, and akin to the Peace Corps launched in 1961, our political leadership has endorsed what is known as the Clean Energy Corps. Universal human participation is key to meaningful global ecological transformation. This not only bears repeating, it must apply to those who currently have little or no stake-hold in creating a sustainable society and urban environment in America's cities. Without the participation of millions of disenfranchised youth in urban America, the transformation of existing building stock is difficult to imagine. The CEC's mission is to provide green collar jobs to hundreds of thousands of young Americans wanting to participate in the Re-Greening of America.

Billions of dollars are earmarked to fund an organizational structure and delivery systems creating the means for communities throughout America to provide a platform for Green Jobs Corps and Youth Build Programs.

Transforming buildings into non-extractive ecological contributors: Insofar as the built environment is concerned, we first begin with transforming buildings from extractive resource and energy components into benign ecological contributors. This idea is now being well received in the architectural design community. It means that it is now feasible, given a long enough period of time to render a return on capital investment, to build and retrofit buildings that produce at least as much energy as they consume. This concept has been popularized as "net zero" energy exchange between buildings and the electrical supply grid to which they are connected. In most cases, use of photovoltaic technology can achieve this objective in combination with a myriad number of devices designed to most efficiently generate, consume, and deliver electrical power. A promising example creating more efficient use of electricity is LED lighting technology. This next generation of lighting fixtures is far superior to today's fluorescent technology. But this encouraging application of "hard tech" solutions is not enough.

Eco-Restorative Design: The application of eco-restorative design now comes into full focus. This is an approach to designing and retrofitting buildings in ways which complement use of both "hard" and "soft" technologies. Eco-restorative design sees buildings not only as energy harvesters; it sees buildings as one would see a coral reef in the ocean. Coral reefs provide habitat for myriad biota. In a similar way buildings can be seen as opportunities to enrich the fecundity of the Earth.

Why is this so important to us? The answer is that humanity can transform the way we use the land and the buildings upon the land so that the planet's bio-capacity is enhanced. As we have seen, at this very moment Earth's natural processes to produce life are slipping. Humanity must seek every opportunity to reverse this erosion of our life-support system. The time has come to envision buildings as biomass-enhancing ecological contributors to the planet.

"Eco-restorative design makes use of buildings and their environs to help replenish earth's ecosystems".

Rendering both existing and new buildings into ecological contributors to the planet is very achievable. Doing so is a process of combining balanced rainwater flows with the nearby vegetative and microbial life forms that always occur around buildings. If we harvest rainwater and store it in ways that optimize building thermal-mass dynamics, and then use it to maintain controlled moisture levels in soil by means of irrigation, we can achieve the following:

- **increase macrobiotic populations in soil** through the interaction of buildings with surrounding landscaped areas (enhance fertility)
- **increase density of life populations** per square meter of ground by enhancing soil quality, soil moisture levels, and therefore biomass production
- **enhance biodiversity** through the application of permaculture and related Agrarian Earth Science principles
- **lower the sine wave of building thermal variations** making it easier to maintain comfortable indoor air temperatures through the use of water stored in foundations
- **eliminate use of precious treated water resources for landscape irrigation applications** through adoption of water conservation and on-site propagation and reuse patterns
- **decrease rainwater flow velocity and volume over time** by temporarily storing storm water concentrations and runoff in building foundations (this protects downstream riparian ecosystems)

The Transformative Urban Vision: creating "Micro-Eden": "Micro-Eden" is a term which can be applied to urban localities where nature is given a chance to reestablish herself on rooftops, vacant lots, streets, and anywhere open areas are exposed to sunlight. The majority of urban space is covered over with buildings, parking lots, streets and other impermeable surfaces. Innovative ways to transform such life-compromising places are available thanks to the application of soft tech science. The application of permaculture tools, such as "bio-intensive" gardening, edible landscaping, and rainwater conservation techniques, can be retrofitted into cityscapes to make Micro-Eden urban havens for people, plants, and animals.

We must visualize changing the extractive ecology of cities into exporters of energy and resources for food and planetary oxygenation. But most importantly, this vision sees masses of disenfranchised humanity with shovels in their hands. The broad application of Agrarian Earth Science is a labor intensive, site-specific process requiring large concentrations of participating people living in cities.

When we create green spaces, fertile ground, and havens for people, we at the same time are creating havens for nonhuman populations. When we step into a story considering both the human agenda, and care for the greater community of life, we find ourselves immersed in a story that is marked with compassionate, humane regard for nonhuman communities.... "*Our fellow astronauts*" as Dr. Buckminster Fuller would say.

The Heart of the Eco-Restorative Design Movement

The combination of hard and soft technological processes is a key contributor toward addressing our environmental stewardship challenges. But they are not, in themselves, enough. There is a foundational prerequisite to the successful application of any technology and visionary idea. It is the underlying thing that shapes and guides how humans first perceive, and subsequently how they are then destined, to interact with the natural forces shaping their cities and neighborhood gardens. From this central point of attention is born the idea of "Eco-spirituality". Thus begins the journey that saw the light of day in Hannover, Germany, well over a decade ago.

One can see how it is possible to commit ourselves to establishing eco-restorative beachheads in each city throughout the world. But the transformation of the human cityscape, to net ecological contributors to the planet, cannot hope for success without first sourcing from the depths of the human spirit a renewed sense of the sacred nature of all life.

What underpins, what inspires, what sets us upon a course of action with deep caring, spawns from our very depths as human beings. For our global venture to work out what inspires and drives us to commit to the "Great Work", as Father Thomas Berry would put it, must be exposed to the light of day. The best of who we are is found in compassionate, humane regard for the firmament, and all that creation has placed upon it. We are as the very ground we walk upon.

We are in and of Earth – intimately connected to one another and the cosmos. Profoundly, eco-restorative thinking reaffirms the spiritual connection that exists between humans and the natural world.

In human endeavor, be it the arts, healing a child, or climbing Mount Everest, it is what we yearn to witness in ourselves and experience in life that drives and motivates us to climb any mountain, however daunting that mountain might seem. It is for us to educate our students, our neighbors, and one another in ways that will see us present to the profundity of life that surrounds every building, every garden, and every tree.

Summary

In 1215 the “*Magna Carta Libertatum*” (the Great Charter of Freedom) required King John of England to proclaim certain rights (pertaining to freemen), with respect to legal process. For the first time in known history the *Magna Carta* saw people determining their king’s will must be bound by the law, not by divine inheritance. In 2000, almost 800 years later, in a similar vein the international Earth Charter finds humanity expanding the notion of human rights by acknowledging the rights of all living communities on Earth, not just the divine inheritance of humans. In this way we are moving towards the realization humanity must be bound by the laws of Nature, and the inalienable rights of all life on our planet. That is to say no longer do we have a divine right to only ask: “what’s best for people?”

Nature is becoming our most compelling arbitrator and teacher. This has set the stage for a new era which acknowledges the sanctity of all life on Earth. This sense of the divine nature in all things can reawaken the human spirit giving those participating new depth to their lives. A growing number of leaders within the educational community see environmental issues as moral issues addressing equitable consideration for all peoples, and for all life communities. Herein is the seed which all communities can water.

We have considered the integration of technological science and Agrarian Earth Science whereby the restoration of the planetary ecosystem can be undertaken by everyone, everywhere. We have looked at how buildings can be reconceived to help restore the land areas surrounding them. We have seen how it is possible to rethink our existing building stock in ways that render the built environment net exporters of energy flows rather than continue with the extractive pattern of present day building science.

We have set forth a challenge that can be addressed by every faith and learning institution willing to educate everyone about sustainable alternatives. Most important to the purpose of this paper are the ideas and actions needed to meet these challenges.

I see our coming together as a gathering of impassioned individuals who are alive to their participation in the outcome of this great play now being co-scripted by both the human and nonhuman communities of earth. Out of this I have come to believe there is a new agenda before us. That agenda is our renewed reverent dance with the natural world. From the eyes of every human being on Earth, nature herself is coming to dominate the human world agenda. Let us respond to that agenda in a humane, purposeful and dedicated way.

Our relationship and attitude toward the natural world significantly defines who we are. What lives within our hearts will shape our destiny with this planet. Above all else, our thoughts, attitudes, and perceptions about our innate relationship with the natural world are the keys to our future failure or success.

Bibliographic Resources

This partial listing provides further resources relevant to the topics presented.

www.350.org - focusing on the number 350 -- as in parts per million -- the level scientists know as the safe upper limit for CO² in our atmosphere. In December, 2009, world leaders will meet in Copenhagen to craft a new global treaty on cutting emissions.

www.aashe.org – Association for the Advancement of Sustainability in Higher Education (AASHE) – provides access to “Cool Campus!” a how-to guide for college and university climate action planning, and to their newly released Sustainability Tracking, Assessment, and Rating System (STARS).

www.climateprotect.org - Through its projects — Repower America, the WE Campaign, and the Reality Coalition — and its affiliated organization, The Climate Protection Action Fund, the Alliance seeks to present choices and offer changes that will protect our planet for future generations; <http://greenerchoices.org/globalwarmingsavecarbon.cfm> -- this website is an exceptional source of information for those who want to learn more about how they, as individuals and families, can reduce their “Carbon Footprint.”

www.livingeconomies.org – Business for Local Living Economies (BALLE) -- helping neighborhood businesses flourish in their local economies. And we're leveraging the power of local networks to build a web of economies that are community based, green, and fair local living economies. [www.engr.pitt.edu/mac/images-t/articles%20and%20docs/CleanEnergyCorps-Full%20Report-Web\[1\].pdf](http://www.engr.pitt.edu/mac/images-t/articles%20and%20docs/CleanEnergyCorps-Full%20Report-Web[1].pdf) -- provides the full text document for the Obama administration plan to provide 600,000 green jobs to disenfranchised young adults affecting 15,000,000 buildings in urban America.

www.fore.research.yale.edu - The Forum on Religion and Ecology is the largest international multireligious project of its kind. With its conferences, publications, and website it is engaged in exploring religious worldviews, texts, and ethics in order to broaden understanding of the complex nature of current environmental concerns.

www.newmonkproject.org – a nonprofit nondenominational education resource for individuals and organizations dedicated to building the Earth from within, offering inspiration, support, and information on topics relating to eco-spirituality.

www.permaculture.org.au – originated the best known contemporary example of Agrarian Earth Science, known by many people as permaculture.

www.restoringeden.org – Christians for Environmental Stewardship – one among many sustainable policy advocacy student based organizations.

www.tlwarchitect.com – a resource of information on eco-restorative design and vision for the forthcoming “Re-greening of America” and eco-restoration topics.

Further information on Micro Edens can be found in my article entitled “Rethinking Houses as Living Systems” in: *The Ecozoic – Reflections on Life in an Ecological Age*, a publication of the Center for Ecozoic Studies, Vol. One, 2008, Chapel Hill, NC.

Eco-restorative design makes use of buildings and their environs to help replenish Earth's ecosystems. Our underlying theme is to reeducate and redirect perceptions about western culture's relationship to Earth. To put this new thinking into action, we will entertain the opportunity to win America's enthusiastic support towards implementing a national green revolution – “Re-Greening America.” Tim Watson