

Into the Great Wide Open: Rethinking Design in an Era of Economic, Social and Environmental Change

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I believe we can accomplish great and profitable things within a new conceptual framework – one that values our legacy, honors diversity, and feeds ecosystems and societies.

- William McDonough, world's leading green architect

Today we have to ask ourselves if it is ethical to design a non-sustainable project.

- Neil Frankel, Past-President, IIDA

Abstract

At the beginning of the 21st century, the challenge of sustainability – reconciling economic, social and environmental aspirations – represents an exciting opportunity for the design profession. Whether this opportunity can be seized, however, will depend on the profession's willingness, and ability, to forge productive and trustful partnerships with both expert and non-expert stakeholders. Success will also be governed by the profession's ability to think creatively about financial, social and natural capital and embed an understanding of the interplay of these capital stocks in projects. Equally important, the emphasis on Cartesian science that has long governed intellectual thought in the West should be tempered with humanism to better ensure that the spiritual and symbolic meaning of landscape and nature is not lost. To begin the work that lies ahead, architects, designers and planners should define a vision of their work as sustainable and ask what they would do that is different from what they do now. This vision should be a manifesto for change that catalyzes critical and creative thinking.

Setting the Stage

In his poetic novel, *Of Time and the River*, Thomas Wolfe (1935) posed a question that has become a talisman for many. He wrote:

*Proud, cruel, ever-changing and ephemeral city
To whom we came once when our hearts were high,
Our blood passionate and hot,
Our brain a particle of fire:
Infinite and mutable city, mercurial city,
Strange citadel of million-visaged time –
O endless river and eternal rock,
In which the forms of life
Came, passed, and changed intolerably before us!
And to which we came, as every youth has come,
With such enormous madness,
And with so mad a hope –
For what?*

I believe the answer is that we come to forge our future. We come, as every generation is said to come, to have our rendezvous with the land (Udall, 1963). The choices we make represent our land and our watershed legacy. That legacy can be one of diminishment, or it can be one of environmental, social, economic, and in its most mature form, spiritual affluence and awareness. The calls we hear today for sustainable living can, without taxing the imagination, be interpreted as a plea for such awareness. They can also, rightly, be viewed as a plea for greater sensitivity to the discipline of landscape architecture, a discipline that in its purest form fuses architecture, planning, civil engineering, horticulture, and ecology, and is informed by philosophy, religion, and literature to make better planning, design and management decisions. When we think about sustainability, when we think about the changes necessary for society to shift to a more sustainable trajectory, we should ultimately think about design – sustainability is the ultimate design puzzle. To solve it, we must learn to think better (see Chapter 1.3 by Richman), to plan better, to design better and especially, to communicate better. We must shift from what Snyder (1969) famously called the urbanizing civilization tradition to an ecologically sensitive, scientific-spiritual tradition:

If man is to remain on earth he must transform the five-millennia-long urbanizing civilization tradition into a new ecologically-sensitive harmony-oriented wild-minded

scientific-spiritual culture. “Wildness is the state of complete awareness. That’s why we need it.”

We must also raise the level of awareness and engagement of watershed stakeholders through productive and trustful collaborative relationships. We must strive to put the right technical and other experts together with the right stakeholders at the right time – a difficult dance requiring artful choreography, but an essential step toward unpacking the puzzle that is sustainability.

Sustainability: An Idea and its Implications

As we begin the 21st century, the relationships between environmental protection, economic development, and social welfare are being explored and debated with great fervor around the world. These relationships, commonly called sustainable development or sustainability, were first cited under that moniker in the *World Conservation Strategy* in 1980, introduced to a wider audience in the report of the World Commission on Environment and Development (WCED) in 1987, and further elaborated at the United Nations Conferences on Environment and Development (UNCED) in Rio de Janeiro in 1992, and Johannesburg in 2002.

The intervening years have not yielded a generally accepted definition of sustainability, but a review of sustainability initiatives throughout the world suggests that it is generally understood to be a roadmap for human development that recognizes the importance and interdependence of environmental, social and economic well-being. John Elkington, the British consultant who coined the term “triple bottom line”, has described it as “the whole set of values, issues and processes that companies must address in order to minimize any harm resulting from their activities and to create economic, social and environmental value.” A partial typology of the arguments and positions would include proponents of “weak” sustainability, who believe that as long as the total stock of natural and human-made capital does not decrease between generations the conditions for sustainability have been met. It would also include advocates of “strong” sustainability, who believe human-made capital cannot be wholly substituted for natural capital. Pearce *et al.* (1992) defined sustainability as a “wealth inheritance – a stock of knowledge and understanding, a stock of technology, a stock of man-made capital *and* a stock of environmental assets – no less than that inherited by the current generation.” The Swedish oncologist and environmental scientist, Karl-Henrik Robert (1997), has spoken passionately about what he calls the resource “funnel” as a metaphor for the

sustainability challenge. As he sees it, shrinking resource supplies coupled to rising consumption creates a funnel in which society exceeds its carrying capacity. He has proposed a series of system conditions, popularly known as *The Natural Step*, to lead society out of the funnel. The list of ideas and definitions goes on, and the debate is a fertile one.

While the specifics of each of these positions differ, some common attributes can nonetheless be identified: (i) sustainability means more than ecological or environmental management; (ii) sustainability is not solely an economic, engineering, technical or scientific problem, although these disciplines have much to contribute to society's search for good questions and answers; (iii) tradeoffs between environmental, social, and economic aspirations, the need for tradeoffs, the information that informs tradeoffs, and the way in which those tradeoffs are made, should be an integral part of sustainability discussions; and perhaps most importantly (iv) a more holistic approach to management, planning, and design will be needed to spur the actions in all sectors of society that foster sustainability – we need a new and more refined lens through which to view the world.

In addition to the general attributes described above, some specific “core” principles are regularly discussed under the guise of sustainability. These include, but are not necessarily limited to: (i) ecological limits; (ii) interdependence; (iii) precautionary principle; (iv) adaptive management; (v) stakeholder view; and (vi) equity. The idea of **ecological limits** is what Herman Daly would call a necessary preanalytic vision to understand sustainability; the Earth is not growing in size and human society must be careful about its use of resources and generation of wastes, lest the global system be overwhelmed. As Wilson (1992) noted:

If enough species are extinguished, will the ecosystem collapse, and will the extinction of most other species follow soon afterward? The only answer one can give is: possibly. By the time we find out, however, it might be too late – one planet, one experiment.

Interdependence postulates that economic and social wealth or prosperity is dependent on the natural environment. Degradation of the productive or aesthetic capacity of the natural environment will therefore erode economic and social wealth. In light of these two ideas, the **precautionary principle** states that the environment should not be left to show harm before action is taken to protect it. The history of human – environment relations shows that variability and unpredictability in ecosystem

functioning have repeatedly confounded management efforts. Watersheds, to take one conspicuous ecosystem example, should therefore be viewed as dynamic systems, effort should be made to continually improve human understanding of their functioning, and decisions with irreversible consequences should be avoided. In particular, these decisions should be made within an **adaptive management** frame; they should be approached in an experimental manner in which the existing state, direction and rate of change in the state of the capital stock (economic, social, natural) is continually monitored, and feedback allows adjustments in decisions to be made. The central idea of a **stakeholder view** of planning and decision making is that anyone who can affect, or be affected by, the products and services of an entity be engaged in decisions about how that entity will operate. In a business context, this principle expands considerably on the traditional shareholder view to include employees, customers, strategic partners, and others along the value chain. A key challenge facing those of us with an interest in sustainable design is this: how do we get these disparate groups to communicate and collaborate more effectively? Finally, **equity** is about fairness, how the economic and social wealth that is created through the use of the natural environment, and indeed the environment itself, is shared in a manner that is fair to each stakeholder.

Several sub-principles aligned with economic, social and environmental aspirations flow from these core principles. They are illustrated in [Table I.2.1](#).

We are beginning to see these attributes and principles manifested in interesting and hopeful new forms. At the 1999 World Economic Forum (WEF), United Nations Secretary-General, Kofi Annan, proposed a “global compact” for business that addresses human rights, labor standards, and environmental protection. These ideas were elaborated at the 2000 Forum, and the UN is now working with the International Chamber of Commerce, the Prince of Wales Business Leaders Forum, the World Business Council for Sustainable Development, and other groups to develop and promote these themes under the masthead of sustainability. Klaus Schwab, President of the WEF, has even proposed a “new set of Ten Commandments”, ethical guidelines “that would guide everyone in getting along” (Machan, 1999). Easy to say perhaps, but so much harder to do (see Chapter I.4 by Mendelsohn). In his essay, *The Zen of Sustainable Use of the Planet: Steps on the Path to Enlightenment*, Cairns (1998) underlined the challenge ahead of us:

The attainment of sustainability faces considerable obstacles. A societal distrust of scientific evidence has arisen that ranges from a belief that science does not differ from

other ways of knowing to a total misunderstanding of how science works. Also, one common belief is that quality of life is more closely associated with consumption or affluence than with environmental quality, and, consequently, that a maintenance of affluence is to be preferred over the maintenance of natural systems.

Still, we try. Calls for the conservation of biodiversity, for example, had been voiced prior to sustainability becoming rooted in the public consciousness in the late 1980s and early 1990s, but since UNCED, biodiversity has been woven into the very fabric of what might be called the sustainability debate. Wilson (1992) described it this way:

The worst thing that can happen is not energy depletion, economic collapse, limited nuclear war, or conquest by a totalitarian government. As terrible as these catastrophes would be, they can be repaired within a few generations. The one process ongoing that will take millions of years to correct is the loss of genetic and species diversity by the destruction of natural habitats. This is the folly our descendents are least likely to forgive us.

The extent of this loss was underscored by Myers (1993), who estimated that global biodiversity losses were on the order of 30,000 species each year. We should approach such numerical estimates cautiously because: (a) we are stepping past the difficult issue of another species' intrinsic right to exist; (b) we don't understand the relationships between species; and (c) we might one day reconcile ourselves to settling on an "acceptable" number of extinctions. That said, we must also, I think, be shamed by Myers' estimate of the number of extinctions before humankind – 1 species every 4 years. If his numbers are accurate we are trending in a perilous direction. This is not merely about aesthetics, this is about survival. If we have learned anything about the natural world it is this: we do not live apart from it; our economic and social systems are dependent on it (see Chapter II.3 by Chandler). Let us pledge to apply ourselves such that this trend does not become destiny. As Clark (1997) noted:

We already rely utterly on renewable resources for our daily existence; the progressive degradation and destruction of these natural capital assets needs urgently to be reversed, and establishment economists more than anyone need to analyze and advertise these vital problems.

Dale and Hill (1996), in a wide-ranging review of the biodiversity literature for the Sustainable Development Research Institute in Vancouver, Canada, highlighted the

societal imperative of protecting biodiversity if sustainability was ever to be realized. They said:

As our numbers increase, we inevitably displace other species. Even in those countries where burgeoning human numbers do not appear to be a problem, we are continuing to displace other species from the highest quality space through deforestation, agricultural expansion and intensification, and urbanization. Every other sustainable development issue, without exception, affects and is affected by biodiversity. Put simply, we need high biodiversity to ensure our own survival.

In view of the focus of this volume, it is sobering to note that aquatic biodiversity has suffered the most egregious losses in the name of human progress and “management”.

Management and Planning

Recognition of the sustainability imperative has spurred public policy, and a good many private initiatives, towards more holistic management, planning, and decision-making. We have seen, for example, the creation of national sustainability plans in several countries including Canada, The Netherlands, The United Kingdom, and Japan. The province of British Columbia in Canada has actively sought to change the nature and pattern of land use over the past decade, and embarked on an ambitious Commission on Resources and the Environment (CORE) in the early 1990s to try and balance environmental, social and economic aspirations (see Chapter 1.5 by Adams). Owen (1993) summarized the broad societal changes that spurred this effort:

As British Columbia's economy has matured and its population has multiplied, the Province's fundamental social values have changed. One of the most dramatic shifts has been a heightened concern for the environment. British Columbians now recognize that sustainability of their economy and communities is entirely dependent on preservation of a sustainable environment.

The CORE mandate was to “develop a strategy with an emphasis on economic, environmental and social sustainability, public participation and respect for aboriginal rights” (British Columbia, 1996). The work of the Commission resulted in a *Land Use Charter* to steer government policy toward sustainability. The *Charter* called for government action to:

- Maintain, enhance and restore life support systems

- Conserve biological diversity
- Anticipate and prevent adverse environmental impacts, acknowledging our incomplete understanding of natural systems
- Account for environmental and social costs in all decisions
- Recognize global responsibility
- Respect intrinsic rights of nature
- Ensure the sustainable use of renewable resources
- Respect the concerns of individuals and communities
- Recognize the rights of aboriginal peoples

Several other provinces and states have recently developed similar strategies.

Elsewhere in Canada, Manitoba passed the *Sustainable Development Act* in 1997 to “create a framework through which sustainable development will be implemented in the provincial public sector and promoted in private industry and society generally” (Statutes of Manitoba, part 1, section 2). In Alberta, the Pembina Institute for Appropriate Development recently announced that it had completed a new accounting system to better accord with the objective of sustainability (2000):

The Sustainable Well-being Accounts use Genuine Progress Indicators (GPIs) to measure the long-term trends that influence our lives on a daily basis – reflecting the values, costs and benefits that matter most to Albertans. The accounts were developed based on changes in the condition of 51 economic, social, human health and environmental indicators over the past 40 years.

In the United States, New Jersey, Minnesota, and Oregon have all signaled their intent to achieve sustainability. New Jersey, under *Executive Order No. 96*, requires all state departments and agencies to provide an annual report on progress toward sustainability. Minnesota is pursuing “a better quality of life for all residents while maintaining nature’s ability to function over time by minimizing waste, preventing pollution, promoting efficiency, and developing local resources to revitalize the economy” (Laws of Minnesota, 1996, chapter 454, section 4A.07). Oregon, under *Executive Order EO-00-07*, requires all government departments to develop and promote “policies and programs to assist in meeting a goal of sustainability within one generation – by 2025”.

The hope, if not expectation, is that this movement toward sustainability will create vibrant places for people to live, work, play, learn and invest. Put another way, an increased emphasis on sustainability should reduce sprawl and traffic congestion, foster

compact communities, and reduce the paving of natural habitats that has characterized too many North American cities and towns. In many respects, this is what Colby envisioned in his celebrated paper, *Environmental Management in Development: the Evolution of Paradigms* (1990, 32):

It is possible that by restructuring along the lines of eco-development, companies and economies might develop new competitive advantages that will help to make those that are quickest to adjust more competitive and prosperous in the long run, rather than less so, as is frequently heard today.

The planning and design profession is poised to be an important catalyst for this transformation. The ING bank building in Amsterdam and the Inn of the Anasazi in Santa Fe are two much talked-about examples of how design can spur sustainability (Hawken et al., 1999), as are the Thoreau Center for Sustainability in San Francisco, and the Jean Vollum Natural Capital Center in Portland. The Thoreau Center includes several features that should become a litmus test for design students and professionals: the use of green building materials; maximum use of natural light and ventilation; ergonomic workspaces; natural fiber insulation; electric car parking and recharging; high efficiency boilers; occupancy sensors; bicycle storage, lockers and showers; high efficiency fluorescent bulbs; and separation, reuse, and recycling of materials removed during construction. Perhaps most encouragingly, it is becoming not just safe, but *de rigeur* to talk about sustainability in the mainstream design journals. For example, the February 2002 issue of *Interior Design* profiled two sustainable building commissions in Ireland for BMA; and the March 2002 issue of *Interiors and Sources* profiled the City of Seattle's sustainable building initiative. More generally, the February 2002 issue of *The Futurist* featured a cover story by Lester Brown on the "eco-economy" (Fig I.2.1) that showed how architects and designers are incorporating the principles of ecology into buildings. A similar view permeates Benyus' influential *Biomimicry* (1997). Sparked by disclosures from the United States' Green Building Council that building operations account for 30-40% of total energy use, 35-40% of municipal solid waste generation, 25-30% of wood and raw materials use, and 25% of water use, architects, planners and designers now realize that they can play an important role in reducing the ecological footprint of the built environment. The sincerity of these efforts, however, is sometimes open to question; the Spring 2003 issue of *Harvard Design Magazine* explored sustainable design myths and realities.

An awareness of three kinds of capital or wealth should underlie genuinely sincere sustainable design projects: (i) financial; (ii) social; and (iii) environmental. Financial capital is about money, and as a society we have tended to place great emphasis on this type of capital, perhaps too much. Our strategic line of sight needs to broaden to include the two other kinds of capital – social and natural. If we can do this, we will move that much closer to achieving what Schumacher (1973) called the “economics of permanence”. Social capital is about people. It includes the economist’s rather narrow view of people and their ability to do work, something that represents an asset for a company or a country, but increasingly, it means more than that. It is, for lack of a better description, about soul. It is about people and companies measuring themselves beyond the bottom line. In a practical sense this means improving internal corporate practices *as well* as community development efforts. It means improving employee relations, encouraging employees to bring their whole person to work, *and* systematically reducing adverse social impacts. The March/April 2002 issue of Business Ethics (2002, 8) reinforced this view:

It’s one of the oldest questions in the field of business ethics: Does socially responsible behavior pay off on the bottom line? New research shows that it does...The overall financial performance of the 2001 list of the 100 Best firms was “significantly better” than the remaining companies in the S&P 500...what we have uncovered with the 100 Best is a model of superior management...by studying the cutting-edge practices of these firms, we find model business strategies in a variety of areas of concern – from layoffs and sweatshops to predatory lending and the environment. These firms show there are better ways to handle these issues than the ruthless practices that are too often the norm.

Natural capital is about nature, but it is more than that; it is the sum total of the ecological systems that support life, different from human-made capital in that natural capital cannot be produced by human activity. Think about the hydrologic cycle, the regulation of the chemical composition of the atmosphere, or the storage and recycling of nutrients. Where are the human-made analogues for these miracles of nature? This is a fundamentally important point. In our rush along the evolutionary corridor to ever-higher levels of consumption, we have been eroding natural capital - the very foundation on which our social and economic systems rest. Hawken et al. (1999) underscored the importance of protecting natural capital:

We need not know that 80 percent of the 1,330 cultivated species of plants that supply our food are pollinated by wild or semi-wild pollinators, but we should be aware that we are losing many of those pollinators including half of our honeybee colonies in the past 50 years in the U.S., one-fourth since 1990.

In some respects, our societal plight with respect to natural capital is not unlike the character in Hemingway's *The Sun Also Rises* (1926) who is asked how he went bankrupt. Two ways, he says: gradually and then suddenly. So, while we can point to some examples of better decision-making, better planning, and better design, examples that reflect some sensitivity to the planet, we need to quickly broaden the discussion and involve more people. We need to engage more people in thinking about the three kinds of capital, helping to define them better, and using them to guide design and other decisions. How do the three kinds of capital inform urban watershed management (see Chapter I.5 by Adams), wetland park creation (see Chapter III.8 by France), or storm-water management (see Chapters III.5 by Apfelbaum, and III.6 by Poole)? How should they inform these activities? We also need to understand that design professionals are regularly confronted with short-term pressures and projects that impinge on the enduring vision and values that are implicit, if not explicit, in sustainability. The protection of ecosystem productivity, for example, is a common and laudable long-term sustainability objective, but too often design professionals are forced to measure the long term against short-term impacts and tradeoffs. Is it fair to say that sustainability is not an either/or position? Can we have it both ways? If we manage the sheer zone between the short and long term is that sustainable?

Design Considerations

Why are the different types of capital being talked about, and what does this mean for the design profession? The answer, I believe, is twofold. First, we must acknowledge that a not insignificant shift in values has transformed society over the past two decades. This is easy. The *Millennium Poll on Social Responsibility*, the largest-ever global survey of public expectations of corporations, reported that "in the coming decade corporate social responsibility is to become a new pillar of performance and accountability of successful companies." The growth of socially responsible investments is a useful proxy in this regard. The Social Investment Forum reports that more than \$2 trillion is now invested in such a manner, up 82% from 1997. The protests in Seattle,

Quebec City, and Genoa at recent WTO meetings are yet further manifestations of the change in social values.

Second, we must ensure that our understanding of these changes informs our approach to design. This is harder. This requires communication and collaboration. This requires the creation of connective tissue between experts in seemingly disparate fields. It is less about searching for the “right” answer than it is about asking good questions, framed by both experts and stakeholders. It is about asking if we are focusing on symptoms such as poor urban air quality rather than causes such as the design of urban areas, or root causes such as design decisions predicated on automobile use. It is about asking if we are inadvertently creating what Quammen (1996) artfully called 36 Persian throw rugs when we undertake a landscape architecture assignment – are we cutting the tapestry that is an ecosystem when we “create” a riparian greenbelt or watershed reserve. The answers to these questions should stimulate new ways of thinking about the kind of society in which we want to live.

Gifford Pinchot, a pioneer of the American conservation movement, noted as early as 1907 that collaboration and discussion, linking seemingly disparate problems and perspectives, was the compass to guide us towards greater understanding of the world around us, and with it, greater reverence for that world. He said:

Here were no longer a lot of different, independent and often antagonistic questions, each on its own separate little island, as we have been in the habit of thinking. In place of them, here was one single question with many parts. Seen in this new light, all these separate questions fitted into and made up the one great central problem of the use of the earth (cited in Udall, 1963).

A similar view permeates the work of Dubos (1980), Firey (1960), Holling (1998) and Thayer (1993), to cite some of the intellectual literati who have made groundbreaking contributions to both ecology and design. Hollings’ meditation on two kinds of science that shape our treatment of the world, a science of parts, and a science of the integration of parts, is especially interesting. We shouldn’t apologize for our specialist or expert knowledge, but the real challenge, and the greatest reward, will lie in the extent to which we can leverage different specialties to forge better, more ecologically sensitive, designs and plans – effective communication within and between disciplines thus becomes paramount. If it is true that the greatest works of landscape architecture succeed because of the designers’ understanding, acknowledgement, and incorporation

of natural systems (see Chapter III.6 by Poole), and if it is true that architecture really does mean the mastery of building (see Chapters II.7 by Winterbottom, and III.7 by Rottle), then we should all be excited at the prospect of new and creative collaboration.

In his brilliant and poetic meditation on the Bella Coola River in British Columbia, *River of the Angry Moon*, Hume (1998) reminded us of the spiritual symbolic meaning of rivers and the reverence they deserve. In doing so, he gave voice to a perspective on the natural world that should light the way ahead for us. He said:

The river is fed by the sky. It runs over a bed of shattered mountains, through the dreams of a great forest and into the mouths of ancient fishes. It starts in clouds as gray and heavy as the sea and ends in a windswept estuary haunted by ghosts. It is a place where white swans dance on dark mud flats and salmon lay fragile eggs in nests of stone.

Conclusion: Learning to See with New Eyes

As we look to the future, let us lead with both our head and our heart. Our head should compel us to be smart; to make prudent decisions that are not irreversible; and to try and improve our knowledge of the world around us. This will require new forms of partnership among both expert and non-expert stakeholders. It will also require the intellectual leadership to champion transdisciplinary work, something that is too often marginalized if not punished in academia. It should be obvious that the complex patterns of interaction that characterize biological and human systems cry out for novel collaborations. They also cry out for novel forms of communication and education. Why is it that lifestyle aspirations and choices, particularly in the northern hemisphere, run against nature? The answer must be more than a failure to “get the price signals right”. On a global scale, we have failed to make the connections between social and economic well-being and nature both obvious and important to more than a green constituency. Yes, we should search for opportunities where our technical ingenuity is particularly well suited, but the larger objective must surely be to focus on dramatically increasing the “nature literacy” of our colleagues, our students, and our clients. Put another way, we must accept and rejoice that we are nature. We must think of Mary Oliver’s poem, *Fry*, and celebrate the clarity of her vision: “*I stare and stare into the water. I say to myself, which one am I?*” Only then can we form the novel partnerships that might allow us to understand the whole system that is our Earth. Our heart should compel us to honor the birthplace of our spirit and the children who will follow us. We

may never solve the mystery that is the green pre-human earth, but we must allow others to try.

To begin this journey, we should define a vision of our organization, project, or community as sustainable and ask what we would do that is different from what we do now. This vision should be a manifesto for change that catalyzes critical and creative thinking (see Chapter 1.3 by Richman). Among the questions to consider are:

- Why does my design firm exist? What am I producing or creating that is truly of value to the community of which I am a part?
- Am I changing or even challenging the mainstream design profession and its dogma, or am I content to do the occasional boutique project?
- What does sustainability mean to me and my colleagues?
- How do (or should) we engage our customers and supply chain partners in a meaningful discussion of sustainable design?
- How should we think about and measure success?

For the student of design, we should temper our traditional emphasis on Cartesian science and reaffirm humanism as an essential lens through which watersheds and landscape should be viewed. In planning a watershed restoration project, for example, we should challenge our students to know something about the physical character of water and the hydriparian landscape, *as well* as the spirit of water. Crucially, this is less about creating something new than it is about remembering the roots of landscape appreciation and study. Humanism informed the work of Humboldt (1844), for example, who used the perspectives of both art and science to study nature and the human mind in nature. We should encourage our students to broaden their perspective, to engage in intellectual and artistic activities that foster humane attitudes and perceptions of landscape. It would not be a bad thing for more design students, and professionals, to write poetry, acquire skills in the visual arts and learn that an artistic impulse can enlarge our perception, knowledge and overall consciousness of the world. Among the more famous examples in this regard are Monet's paintings of water lilies, Steinbeck's depiction of the California Dustbowl and Lopez' discussion of the Inuit and their life amid the ice. We should see, if not the brave new world of design in their work, the promise of what design might yet become. As Daniel Libeskind has said, "every architect has a language, a palette of light, colour and proportion: a recognizable hand." What is wrong with that identity being inextricably linked to a vision of sustainability?

Our willingness to ask searching questions about what we do and why we do it; our willingness to engage our students in a different kind of learning; and our willingness to accept that there are many ways of knowing should shape our ability to meet the design challenges of an era that is characterized by economic, social and environmental change. Put another way, it will determine if we can, as Proust would have us, “see with new eyes” and frame our design challenges to accord with the principles of sustainability.

The paradox of our evolution is that our progress has begun to imperil the “natural capital” on which we depend. Our capacity to create social and economic wealth, or well-being, is inextricably linked to the natural world. We need a new generation of design thought and action that marries an understanding of the productive and aesthetic capabilities of nature with an appreciation for what John Muir so aptly called a refuge from the roar of daily life. Herewith then, a closing “call to arms” that might light the way ahead:

1. Think about your children – take the long view.
2. Protect natural capital.
3. Don’t wait for someone else.
4. Don’t wait for regulation.
5. Encourage others to follow.
6. Talk about what you’re doing, and why.
7. Don’t be “top down”, or “bottom up”, be both.
8. Encourage, and reward, your colleagues and stakeholders.
9. Swim upstream – As Will McDonough would put it, do not put a filter on the smokestack, or outfall pipe; put a filter in your mind.

Table I.2.1

Sub-principles for Economic, Social and Environmental Components of Sustainability

Sphere of Sustainability

Sub-principle

Examples of How This Sub-principle is Manifested

Economic

- Quality of economic life
- Full-cost assessment
- Value non-monetized work

Financial prosperity at a firm level (SVA) and at a community level (low or no unemployment).

External environmental and social costs are identified and internalized.

Community engagement; volunteerism.

Social

- Quality of society
- Participatory decision-making
- Shared responsibility

Social capital is created and nurtured at a firm level and community health is high (low or no crime; low frequency of clinical depression; people feel good about themselves and the community).

Access is created within the firm and the community for people to become involved; people become involved because they feel they have a stake in the firm and the community; people's views are heard and valued.

Shared mental model within the firm and the community that no one individual or firm can "provide" sustainability.

Environmental

- Quality of environment
- Cumulative effects
- Synergistic effects
- Aesthetic value

Sensitivity to physical and perceptual changes in the biophysical environment.

Sensitivity to low level, chronic discharges that might change the physical or perceptual quality of the environment.

Sensitivity to materials or wastes that, while individually benign, might erode natural capital when combined.

Sensitivity to non-productive value of natural capital (option or existence value).

Figure I.2.1

Signs of the Times – Architects and Designers Create the Eco-Economy

Literature Cited

- Benyus, J. 1997. *Biomimicry: Innovation Inspired by Nature*. New York: Quill.
- British Columbia. 1996. *Initiatives for the Conservation of Biodiversity in British Columbia*. Victoria, October, 1996.
- Cairns, J. 1998. "The Zen of Sustainable Use of the Planet: Steps on the Path to Enlightenment", *Population and Environment*, 20(2): 109-123.
- Clark, C.W. 1997. "Renewable Resources and Economic Growth", *Ecological Economics*, 22: 275-276.
- Colby, M. 1990. *Environmental Management in Development: The Evolution of Paradigms*. World Bank Discussion Paper (No. 80).
- Dale, A. and Hill, S.B. 1996. "Biodiversity Conservation: A Decision-Making Context", in *Achieving Sustainable Development*, Dale, A. and Robinson, J.B., eds. Vancouver: UBC Press.
- Dubos, R. 1980. *The Wooing of Earth: New Perspectives on Man's Use of Nature*. New York: Charles Scribner's Sons.
- Firey, W. 1960. *Man, Mind and Land*. Glencoe, Illinois: Free Press.
- Hawken, P. et al. 1999. *Natural Capitalism: Creating the Next Industrial Revolution*. Boston: Little, Brown.
- Hemingway, E. 1926. *The Sun Also Rises*. New York: Charles Scribner's Sons.
- Holling, C.S. 1998. "The Renewal, Growth, Birth and Death of Ecological Communities", *Whole Earth* (summer).
- Humboldt, A. von. 1844. *Cosmos*, vol. 1 and 2. New York: Harper and Brothers.
- Hume, M. 1998. *River of the Angry Moon: Seasons on the Bella Coola*. Seattle: University of Washington Press.
- Lopez, B. 1986. *Arctic Dreams: Imagination and Desire in a Northern Landscape*. New York: Charles Scribner's Sons.
- Miller, M. 2002. "100 Best Corporate Citizens", *Business Ethics*, 16(2): 8-12

- Myers, N. 1993. "Biodiversity and the Precautionary Principle", *Ambio*, 22(3): 74-79.
- Oliver, M. 1995. *Blue Pastures*. San Diego: Harcourt Brace & Company.
- Pearce, D. et al. 1992. *Blueprint for a Green Economy*. London: Earthscan Publications Limited.
- Quammen, D. 1996. *The Song of the Dodo: Island Biogeography in an Age of Extinctions*. New York: Touchstone.
- Robert, K.H. et al. 1997. "A Compass for Sustainable Development", *International Journal of Sustainable Development and World Ecology*, 4: 79-92
- Schumacher, E.F. 1973. *Small is Beautiful: A Study of Economics as if People Mattered*. London: Abacus.
- Snyder, G. 1969. *Turtle Island*. New York: New Directions Publishing Corporation.
- Steinbeck, J. 1939. *The Grapes of Wrath*. New York: Viking.
- Thayer, R. 1993. *Gray World, Green Heart: Technology, Nature and the Sustainable Landscape*. New York: John Wiley & Sons.
- Udall, S. 1963. *The Quiet Crisis*. New York: Henry Holt.
- Wilson, E.O. 1992. *The Diversity of Life*. Cambridge, MA: Harvard University Press.
- Wolfe, T.C. 1935. *Of Time and the River: A Legend of Man's Hunger in His Youth*. New York: Charles Scribner's Sons.
- World Commission on Environment and Development. 1987. *Our Common Future*. London, England: Oxford University Press.