

The Winners of the Blue Planet Prize

1998

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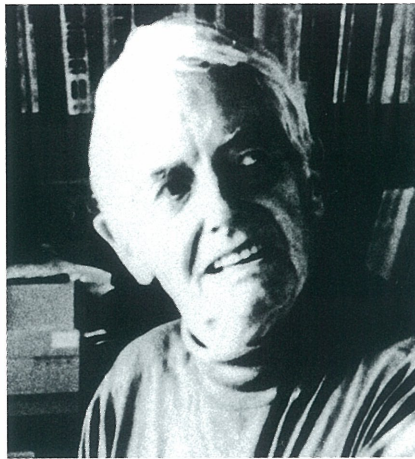
Blue Planet Prize

**Professor Mikhail I. Budyko
(Russia)**

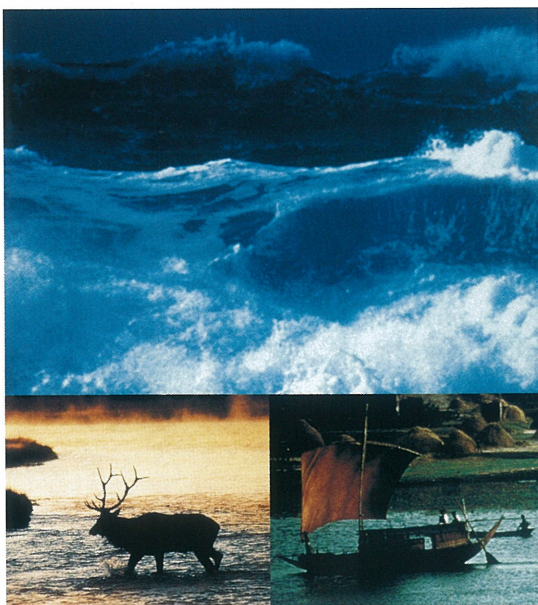
Head of the Division for Climate Change
Research, State Hydrological Institute

**Mr. David R. Brower
(U.S.A.)**

Chairman of the Earth Island Institute



At the 1998 Blue Planet Prize Awards Ceremony, the opening slide presentation revealed the beauty and wonder of both water and life. This presentation seeks to remind us that water sustains and links together all forms of life on the earth.

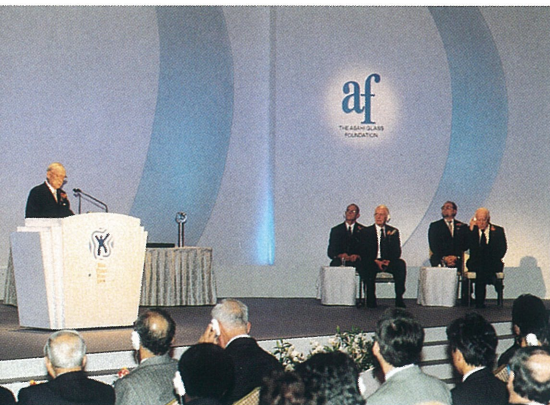




Their Imperial Highnesses Prince and Princess Akishino at the Congratulatory Party.



His Imperial Highness Prince Akishino delivering a congratulatory speech.



Jiro Furumoto, chairman of the Foundation, delivers the opening address.



Prof. Mikhail I. Budyko and his research partner of 30 years, Gennady Menzhulin, in the Blue Planet Prize Commemorative Lectures.



Thomas S. Foley, Ambassador of the United States to Japan (left), and Vassili Dobrovolski, Minister-Counsellor of the Russian Embassy in Tokyo (right), congratulate the laureates.



Mr. David R. Brower and his son, environmental journalist Kenneth Brower, in the Blue Planet Prize Commemorative Lectures.

Profile

Mr. David R. Brower

Chairman of the Earth Island Institute

Education and Academic and Professional Activities

- 1912 Born in July in the United States.
- 1929-1931 Attended the University of California.
- 1933 Joined the Sierra Club.
- 1935-1938 Worked in Yosemite National Park (as publicity manager for two of these years).
- 1941-1952 Editor, University of California Press.
- 1952-1969 First Executive Director, Sierra Club.
- 1956 National Parks Association Award.
- 1967 Paul Bartsch Award, Audubon Naturalist Society.
- 1967 Honorary Degree, Hobart and William Smith Colleges.
- 1969 Established Friends of the Earth.
- 1970 Brooklyn College Library Association Award.
- 1973 Honorary Degree, University of San Francisco; University of Maryland.
- 1977 Honorary Degree, Colorado College.
- 1979 Golden Ark Award, Prince of the Netherlands.
- 1982 Founded the Earth Island Institute.
- 1984 Honorary Degree, New School for Social Research.
- 1985 Honorary Degree, Sierra Nevada College.
- 1987 Strong Oak Award, New Renaissance Center.
- 1994 Robert Marshall Award, Wilderness Society.
- 1995 Honorary Degree, Lincoln Law School.
- 2000 Deceased, November 5.

In the United States in the 1930s, when awareness of environmental issues had yet to become widespread, Mr. Brower resolved to help preserve the environment in its natural state for future generations. Mr. Brower devised a three-fold method of guarding nature and biological diversity, which can never be restored once lost. His method is known as CPR. "C" is for the rational use of natural resources through Conservation; "P" is for the Preservation of threatened, endangered, and undiscovered species; and "R" is for the Restoration of what humankind has damaged. Based on CPR, Mr. Brower has developed original environmental education methods and a code of ethics.

Mr. Brower conducted a wide range of research into environmental problems using social scientific methods and wrote many books and produced films, using the media to publicize the different facets of environmental issues and appeal to the public. He also lobbied in

Congress for his causes. Through these types of independent environmental education campaigns, Mr. Brower helped halt proposed dam construction in the Grand Canyon and contributed to the establishment of national parks and seashores.

Mr. Brower's environmental conservation activities also extended to the Earth as a whole planet. He fostered the concept of choosing places important in terms of biological diversity, ecosystems or geology, and designating them international legacies. This concept was realized in the establishment of UNESCO's system of World Heritage sites.

Between 1952 and 1969, Mr. Brower served as the first executive director of the Sierra Club, helping it grow into a major environmental organization. In 1969, he established Friends of the Earth, and in 1982 he founded the Earth Island Institute. These organizations are helping to protect nature, save species threatened by extinction, and fight pollution by linking environmental issues with global social and political issues. Through these organizations' efforts to show how the environment is involved with nuclear threats, overpopulation, poverty and war, Mr. Brower played a vital role in the international environmental movement.

Comments on the Draft Yosemite Valley Plan

David R. Brower

July 2000

Right now, the National Park Service (NPS), which has heretofore cherished Yosemite, seems intent on converting this temple into a profit center, with pricey hotels, scant camping, few modest accommodations, wider roads to field bigger diesel buses, ecological roadside mayhem, atmospheric damage statewide, people who want to celebrate Yosemite Valley required to tie their cars outside, in various still unspoiled places, soon to be paved. All to exploit what you can do when you have two or three hundred million dollars to spend instead of the discipline former NPS Director Newton Drury enjoyed when he said, "We have no money, we can do no harm." The NPS is trying to do too much, too fast, in Yosemite, forgetting that protecting the Park, not Yosemite Park Service revenues, is the most important thing here. It's time the NPS remembered what Yosemite is all about.

Anyone who has been visiting Yosemite for almost 82 years is likely to brag about it, and I do incessantly. I started going to Yosemite in 1918. There were 37,000 visitors that year and I celebrated my sixth birthday camped alongside the railroad that was helping construct an alien dam in Yosemite's Hetch Hetchy Valley. Restoring this lost treasure should be an ongoing part of the Park Service agenda.

Unbeknownst even to many in the Park Service, Yosemite was the first national park—set aside eight years before Yellowstone—and its mission clearly stated a year later by none other than Frederick Law Olmsted. After he had done his bit for Central Park, Olmsted came out to California and the Fremont Estate to recover and to advise California how to take care of the best of its nature, including Yosemite. Mountains can use a voice, and Frederick Law Olmsted was one of the first to try to speak for them.

He proposed the rights for nature implicit in the national park idea.

"The first requirement is to preserve the natural scenery and restrict within the narrowest limits the necessary accommodation of visitors.

"Structures should not detract from the dignity of the scene. In preventing the sacrifice of anything that should be of the slightest value to visitors to the convenience, bad taste, playfulness, carelessness, or wanton destruc-

tiveness of present visitors, would probably yield in each case the interest of uncounted millions to the selfishness of a few.”

Thus, in 1864, did an idea born on one coast reach another.

Maybe Olmsted can help all of us, including the NPS, remember what the national park idea, perhaps America's best, is all about. It was probably not just to let people who can afford the Ahwahnee or Yosemite Lodge to luxuriate there, but a place to celebrate a bit of equity in a magical place meant to be shared with the current brief tenants of the Earth; but most importantly, held in trust for the “uncounted millions” not yet born. The greatest luxury in Yosemite comes from what the Valley has to say, not just from its structures. If Old Dave Brower wants to go slumming at the Ahwahnee, OK. But maybe his kids and friends would rather camp, the way he used to.

I am deeply concerned these days about Yosemite. As I am old fashioned enough to believe that national parks were not set aside to create profit centers for concessionaires or to pad NPS construction budgets for park officials to short-change the future. Large crowds are seasonal, but new roads, hotels and parking lots despoil the park year-round.

I saw the trouble begin with Mission '66, when then-NPS director, Connie Wirth went to the American Automobile Association, not to conservationists, for advice. What he let happen to Yosemite in the controversy over re-routing the Tioga Road was a disaster the Sierra Club let happen by not opposing it strongly enough. NPS people should have been jailed for what they destroyed at Tenaya Lake, just as I would now urge long sentences for engineers who molest roads until they are big enough to accommodate big diesel buses. Left alone, they would get rid of Yosemite's autumn color with two-stroke leaf blowers.

In the 1950s, my attempt to save Yosemite from what Ansel Adams described as NPS vandalism at Tioga was enthusiastic enough to bring Horace Albright, second director of the NPS, to San Francisco to try to get me fired as executive director of the Sierra Club. He was not successful, but neither was I successful in stopping the NPS demolition of Tenaya's granite domes. I have had more than one Park Ranger recently lament to me how right we were to have opposed that project and how our alternative would have been better all around. We have seen this pattern repeated in the Merced River Canyon, where Judge Ishii confirmed the righteousness of our protest against illegal NPS vandalism of the river, but mostly too late. When I see the war-zone that used to be the Merced River Gorge in Yosemite, I am furious that the criminals that pushed this project through in violation of NEPA and the Wild and Scenic Rivers Act are allowed to continue their shoddy planning in the rest of the park rather than taking some time out to rethink (in jail preferably).

On the contrary, no one is taking time out and no one is rethinking (and none of the law-breakers are in jail, or even repentant). The Merced River Plan was rushed through using old wildlife data (the wildlife situation may have changed a bit since one bank of the river was paved by NPS). The River Plan was not meant to be a formality; it was intended to be the biological foundation of planning efforts for the entire valley. Judge Ishii's statements in the courtroom indicate that he would concur. If NPS is not violating the letter of his ruling, releasing the

Draft Valley Plan before the River Plan was finalized certainly violates the spirit of Ishii's call for sound planning. I call on the NPS to submit a complete plan for the Merced River before asking us to comment on a Draft Valley Plan. NPS seems to be drunk on appropriations money, hell-bent on another "Tioga Hangover." This time I don't have another 40 years to wait for the NPS to realize its mistake. It's time to wake up, and for God's sake, no more construction on the river between the 120 Junction and the Valley!

This brings us to the next major disaster contained in the Alternatives of the Valley Plan. Why did that road need to be widened (other than to spend some of the Congressional cash)? In a private statement to me in a meeting last year, Regional NPS Director John Reynolds said that the road had to be widened because buses were a necessary piece of Yosemite's transportation future. He repeated this once to the press, but has been denying it ever since. The emphasis on diesel buses in the Draft YVP force me to infer that he was telling the truth the first time. With the EPA in California and Washington, D.C., both currently cracking down on diesel as a carcinogen and a massive air pollution problem, it is unconscionable for NPS to advocate for a dramatic increase in diesel traffic in Yosemite Valley. Yosemite gets more pollution than it needs already from the Central Valley without creating a new toxic menace locally. Until clean-fuel buses can make the grade, we are stuck with diesel, which is far dirtier than modern cars (even per passenger-mile!). The Central Valley is beginning to look to rail as a solution to its air problems, and I strongly encourage the NPS to climb aboard this statewide effort, which can be part of the solution for Yosemite as well (see addendum for more).

Finally, let's put the brakes on any new parking lots! Parking is currently sited in areas long-since developed, while the Draft YVP suggests that we pave over huge lots in unspoiled areas of the park so diesel buses can service expanded hotels in the valley on widened roads (NPS may want to see the additional facts I have discovered on toxic leaching from new asphalt before it paves one more square inch of the park. See addendum). All of the alternatives are all based on the assumption that it is inevitable that we will continue to try to pack as many people into the park as possible at any given time. Congestion problems are relatively easy to solve as Ansel Adams said; "When the theater's full, they don't sell lap-space." National Parks were created to be a natural haven from the world of mindless development and endless growth. Placing no limit on the numbers of current visitors that can visit the park at one time is a violation of the Organic Act and a breach of our contract with future generations. This may be easy to miss with so much Fee-Demo money pouring into Yosemite, but it is your job as the appointed guardians of Yosemite not to miss it.

So skip the hotel expansion, replace lost camping instead, and if you want parking lots, limit them to impacted non-riparian areas where other structures are being removed (not at Camp 6 or Taft Toe). As for Restoring Yosemite, I'm glad the Park Services is at least aware of the concept, but I don't see much restoration in the plan that isn't undone by destruction elsewhere. That's not restoration; it's called mitigation, as your highway building friends can tell you. If you widen Southside Drive and pull out other roads, there is no net ecological gain, especially if the other roads are not actually removed. Bruce Babbitt and others have said that the future of the parks is in restoration. I heartily agree and will begin applauding the moment

that NPS finishes using this kind of language as green-wash for half-baked development plans like the Draft Yosemite Valley Plan.

Lecture

CPR for Business and the Planet

David R. Brower

It is my distinct honor and pleasure to stand before this audience today as a recipient of the Asahi Glass Foundation's Blue Planet Prize. I applaud the Asahi Glass Foundation for the wisdom and precociousness it took to create the world's most prestigious prize recognizing environmental work. I thank the Foundation for their profound contribution to the world of environmental science and the global movement to raise awareness of environmental problems.

Unlike Dr. Budyko, I cannot claim to have been a great scientist, so I am honored that much more to be placed in such esteemed company. In my career, I have not focused on adding to the scientific understanding of the world, but have merely borrowed from great scientists in an attempt to raise public awareness of their work. I have edited and designed far greater books than I could ever write myself, hoping that my efforts could make the genius of others more accessible to the public. Similarly, the scientists whom I employed or published for did work far beyond my means. I thank all of these people who should rightly be standing in my place today for allowing me to receive this honor. My lecture today will be more of the same, attempting to showcase for you some of the best thinking I have come across in 60 years of working for the environment. I speak not to offend or alarm, merely to bring awareness to the great threats and even greater opportunities that present themselves to us at this unique moment in history.

Raising Awareness of the Environmental Impact of Economic Activity

Since April, I have paid particular attention to all the worrying going on in the U.S. media about the precarious "bubble economy" in Japan. We now have our own economic problems to worry about, but I would like to borrow the idea of a "bubble economy." If a bubble economy results from losing track of the real value of our capital, I suggest that we are all part of a larger global bubble economy. I speak of the global industrial bubble economy that has so mismanaged the natural capital of the earth's ecosystems. Today, for the duration of this lecture, I ask you to consider that the recent economic downturn could be an amazing opportunity to move beyond this global industrial bubble economy. I am betting that the strength of the Japanese spirit will be an important part of this transition. This is an opportunity for Japan to continue its tradition of industrial trailblazing by leading the world toward a new economy that places proper value on the natural world and the human ecosystems within it.

My first visit to your beautiful country was in 1976 when the U.S. Information Agency asked me to talk in seven cities—from Fukuoka to Sapporo. I have been back six times since then, most recently in 1994 for Nagaragawa Day where I joined six thousand Japanese who wanted to keep their last wild river as wild as possible. Now it is my greatest honor to return to Tokyo to receive the Blue Planet Prize.

Each time I come to Japan, I am first aware of the many differences between the United States and Japan, but then I begin to notice one unfortunate similarity. David Suzuki, a Japanese-Canadian, says that the great Harvard University biologist, E. O. Wilson, when asked how many human beings the world could sustainably support, replied: "If they have the appetite for resources of the United States and Japan, two hundred million."

Our two countries alone have about twice Dr. Wilson's sustainable population figure and the other five billion people want to live as we do. But is this truly possible? In the last 50 years the United States, alone, has used up more resources than all the rest of the world in all previous history. Most Americans are pretty happy about this, but no one else in the world is, and they have been showing their displeasure recently.

Two more statistics begin to expose the industrial bubble economy for the precarious illusion that it is. Author Paul Hawken examined global population and consumption trends and calculated that if the world, especially the industrialized world, wants to keep up its present pace, it will have to produce as much food in the next 40 years as the entire world has produced in the last eight-thousand years.

And a second statistic. A group of scientists led by Dr. Robert Constanza of the University of Maryland last year calculated that the world receives at least US\$33 trillion dollars annually in free services from the earth's ecosystems, while the estimated world GNP hovers around US\$20 trillion. Ecosystems services, like the pollination of our food crops by wild insects, would affect our calculation of the world GNP only if they stopped being free. These services stop being free if the key species that support the ecosystems go extinct. Then we must pay to replicate this service by other means. This is a real and present danger. According to a recent survey, it is the professional opinion of seven out of 10 U.S. biologists that human disturbance of ecosystems is now causing the fastest mass extinction of species in the earth's history.

Our global bubble economy becomes more precarious daily even as our industrial economies grow. Yet few people question economic growth. In fact, we are unhappy with our politicians if the economy does not grow every year. If this kind of unchecked growth occurs in an individual, we call it cancer. In our economies we call it progress. At what cost this progress? In a book we put together 20 years ago at Friends of the Earth, *Progress as if Survival Mattered*, we posed the twin questions: What kinds of growth can we no longer afford? And, what kinds of growth must we have? After all, growth does not have to be a bad thing; Friends of the Earth now has branches in 58 countries around the world, including Friends of the Earth Japan.

Is the economic growth that we so prize in our countries a kind of growth we can no longer afford? The answer can be yes and it can be no. The various responses we have seen to the Kyoto Protocol showcase this dilemma. Some countries have stressed returning to old nuclear and hydroelectric technologies, while others are investing in new, cleaner technologies like solar and hydrogen power. In the United States, we seem to be doing neither, and in Japan we see both. Japan is both the acknowledged world leader in solar technology and a major developer of nuclear and hydroelectric facilities with 20 new nuclear reactors proposed and 11 new hydroelectric dams under construction. Although these dams and reactors may help Japan

comply with the Kyoto Protocol far sooner than the United States, they are not a sustainable source of economic growth. Still, I acknowledge business and government in Japan for taking bold initial steps with their solar-roof program, their new product take-back laws, and their subsidies for electric vehicles. I hope they will continue to show their American counterparts what it takes to truly make your nation a world leader.

In his book *The Ecology of Commerce*, Paul Hawken argues that with the scale of the environmental problems being what they are, only businesses are powerful enough to effect an environmental turnaround. The time for that turnaround is now. The current global economic downturn can be seen as an opportunity to reevaluate the way we do business. I once said, only half-joking, to Mikhail Gorbachev: "We are watching Russia very closely, and if they can make democracy work, the United States is going to try it." Similarly, we have never really tried capitalism. How can we have capitalism when all the capital is not on the balance sheet? All of our economic figures and incentives change when we calculate in that US\$33 trillion worth of services that the world's economy receives annually from natural ecosystems.

The Next Industrial Revolution: Redefining Capitalism for Future Generations

This year, Paul Hawken has written a book with Amory and Hunter Lovins that shows us commerce that actually accounts for this natural capital. They call it *Natural Capitalism: The Next Industrial Revolution*.

The Next Industrial Revolution is already underway and is based on extracting wisdom and information from nature rather than raw materials. We have already heard that we are entering the Information Age with the advent of ever-smaller silicon microchip technology. There are many opportunities for improvement, even in these advanced designs; for example, the production of a single microprocessor in your computer generates 8000 pounds of hazardous waste water.

If the bad news is that even our most ingenious designs have failed to consider the welfare of the planet and our future on it, the good news is that we did not design the planet or its inhabitants. Examples of designs for technologies that do not imperil future generations are all around us and even within us. The life-friendly designs I speak of are the designs of life itself. The more we begin to design and refine our own information-driven technologies, the more we will recognize the beauty and brilliance of evolution's designs. After all, anything that didn't work got recalled by the Manufacturer.

In nature, information is king, but the original Information Age ran on DNA, not silicon, and created technologies we still haven't figured out. The story of the abalone provides an example.

Ceramics, once relegated to the dinner table, are now used in high-tech applications from car engines to electronics. Problems arise because of the tendency of ceramics to shatter under pressure. Abalone produces a far superior technology. Its shatterproof shell requires no firing in kilns or treatment with harsh chemicals. The shell is made at sea water temperature and is made of protein and the minerals suspended in sea water. The secret is in the unique DNA sequences the abalone possesses, which code for specific sequences of proteins that in turn attract ions in the water to specific sites on the protein matrix. Spongy layers of protein

alternate with hard mineral layers to form a hard shell with enough resilience and cohesion to be shatterproof. Scientists at the University of Washington are now hard at work trying to apply the principles of abalone shell construction to build their own energy-efficient, life-friendly, shatterproof ceramic. We begin to see some of the principles of manufacturing for the Next Industrial Revolution: use common, local materials, life-friendly temperatures and materials, and substitute information and good design for energy and costly resources.

All of this design brilliance came, about in the laboratory of our prehistoric wilderness planet. From the wilderness we came and it is there again we must look for answers to our most vexing questions. "The wilderness," Nancy Newhall once wrote, "holds answers to more questions than we yet know how to ask."

CPR for the Earth: Toward the Restorative Economy

One of those questions we have only just learned to ask is how we design our commerce to work for the planet, not against it. For many years, I have asked audiences all over the United States to devote a year of their life to working for the earth. One year of CPR for the earth. CPR most commonly stands for cardiopulmonary resuscitation, an emergency medical procedure to restart a patient's heart and lungs when they have stopped. In this case, the patient is the earth. CPR means reviving the patient through Conservation, Preservation, and Restoration. In every audience, though I get a positive response to this idea, most people, most of the time are not doing CPR for the earth, they are simply doing business. In the Restorative Economy, CPR for the earth happens in the course of doing business.

"C" stands for conservation: we must use fewer natural resources and get far more productivity out of what we use. Japan has been a world leader in energy efficiency, about twice as efficient as the United States, and together we can do even more. U.S. architect William McDonough observes that in natural systems "waste equals food." The concept of waste does not exist. Smart companies are realizing that they have been "wasting their waste" by treating it as a liability to be hauled away or burned when it could be a resource-food for some organic or industrial process. Pollution is inefficiency: raw materials paid for and then squandered. Organic waste can be sold as soil or animal feed. Inorganics can be placed in closed-loop systems that feed them back into the production process. Profit incentives are thus created by designing products and using raw materials that reenter the food chain productively, into nature or back into the factory. A Swiss textile factory redesigned by William McDonough to use no harmful chemicals baffled local environmental inspectors by actually purifying the water that passed through the plant. Their next project is to have no water pass in or out of the plant.

"P" is for preservation: if we wish to extract the design wisdom and ecosystem services from the natural world, we must preserve intact ecosystems. Ecosystems that remain intact provide the world's best, cheapest water purification, flood control, pest control, crop pollination, climate regulation, soil construction, water storage and many other services. New York City recently decided that the cheapest way to purify its water was to purchase and preserve the watershed in the Adirondack Mountains that was the source of its drinking water. Many other U.S. cities are now preserving ecosystems to purify water because it is millions of dol-

lars cheaper than building water treatment facilities. By contrast, in Thailand, deforestation has contaminated rivers and left Bangkok so dependent on ground water extraction that the city is sinking and is now below sea level.

If we learn to respect the wilderness too late, we will find that by the time we have learned how to ask the questions, the piece of wilderness that held the answer will be gone. For example, only recently have we asked, "Why do we die of cancer and other diseases, but many species of sharks never get tumors and seem resistant to most infections?" One doctor asked this question and discovered a powerful new antibiotic in the dogfish shark. Yet over-fishing has led to a worldwide decline of sharks, which are often killed only for their trademark fin. The invaluable information of the world is stored in the bank of its genetic and species diversity, and with 40-100 species disappearing every day, we will soon be bankrupt.

"R" is for restoration: restoration can be profitable. Just ask your dentist or doctor. We need more people who will be like doctors for the earth, healing the body of the earth and being paid very well for it. Restorative businesses move beyond sustainability—merely "doing no harm"—and make a gift to future generations by ensuring that they are left with more natural beauty and resources than we ourselves had. Doing such meaningful work will also lift the spirit of people employed in healing the earth.

Making our economy restorative to both people and the planet is an enormous redesign project that has already begun in many places. In the United States, two Vermont designers, Nancy and John Todd, have found a way to restore natural capital by replacing standard waste water treatment facilities with a series of biodiverse, interrelated ecosystems they call the 'Living Machine.' A Living Machine is composed of plants, animals, insects, and microbes that work together to provide all the purification of chlorine-based, energy-intensive treatment, for a fraction of the cost, in a facility so beautiful that you could mistake it for a greenhouse.

In impoverished areas of U.S. cities from New York to San Francisco, community gardeners have reclaimed abandoned urban land to provide food, income and a sense of community.

Simultaneously, on two distant continents, visionary scientists and community members in Gaviotas, Colombia, and Auroville, India, are showing us how to live lives of extraordinary creativity and fulfillment by taking on the challenge of restoration on the planet. Each village began on a desolate, infertile landscape that nobody wanted. Now, in Gaviotas and Auroville, dense forests and diverse biota have been restored and people have reinhabited the land in a way that sustains their newfound natural riches.

Restorative Business Practices and The Natural Step

The industrial leaders of the Restorative Economy are emerging as well to take their place in the global environmental movement, which has historically been dominated by public-interest NGOs. As an alleged leader, or even father, of the modern environmental movement, I feel it is quite safe to pass the baton to visionary businesspeople like Ray Anderson, CEO at Interface, Inc., and Takashi Kiuchi, managing director at Mitsubishi Electric Corporation.

It is easy to grow discouraged in my work, but having the opportunity to serve on Ray

Anderson's advisory team has been my most uplifting experience. Mr. Anderson's Interface Corporation is a small company compared to Mitsubishi Electric, having done US\$1.3 billion last year in sales, but there is nothing small about the company's mission to "become the first name in industrial ecology, a corporation that cherishes nature and restores the environment." Interface is a leader in the global carpet and textiles business doing business in more than 110 countries around the world. They have reported record quarterly earnings consistently since they began redesigning their operations in 1994. But record earnings are not enough for Interface; it is now their goal to generate profits only in ways that do not steal from future generations.

Ray Anderson did not acquire his well-developed ecological conscience climbing mountains or floating down rivers as I did. He grew Interface for 21 years into an industrial leader, but in 1994, while the business was in transition, Ray Anderson realized that his company had no long-term vision. Then, by some divine fortune, he happened to read *The Ecology of Commerce* and he became aware for the first time of the full responsibilities involved not only in being a CEO, but most importantly, the responsibilities of being the grandfather of five young children.

Ray Anderson has since embarked on a quest to run Interface in a manner consistent with the future he wants for his grandchildren and their children. Over several years, Interface reduced waste, cut energy use, cut pollution and expensive toxic materials, and redesigned the manufacturing processes to the point where they experienced a growth in sales from US\$800 million to US\$1 billion with no increase in net resource use. This may be as Ray Anderson says, "the first US\$200 million of sustainable business." If we can, in this way, decouple economic growth from the destruction of the biosphere, this may yet be a kind of growth we can still afford.

Interface has institutionalized this concern for the future by introducing all its employees to the precepts of *The Natural Step*, a scientific consensus on what it takes to create a sustainable society. The consensus began with 30 scientists in Sweden and has spread to scientists throughout Europe, the United States and several other countries. There are four natural laws that all these scientists agree that human activities must abide by. First, substances in the earth's crust must not systematically increase in nature; this includes all metals, minerals and fossil fuels. Second, man-made materials like synthetic plastics and PCBs cannot be produced at a faster rate than they can be broken down and integrated back into nature. Third, the productivity and biodiversity of nature cannot be systematically reduced. Fourth, human needs must be met by a fair and efficient use of resources because, in the long run, social inequities are not sustainable.

At first, these principles may sound overly restrictive, until we think of them not as a barrier, but as a compass by which to navigate. Interface and many other leading companies use *The Natural Step* framework to point all their employees in a uniform direction, without mandating the specific technologies or business practices to be used. *Natural Step* companies find that this leads to many new innovations.

In Japan, Takashi Kiuchi, managing director at Mitsubishi Electric, has also embraced *The Natural Step* as a tool to guide Mitsubishi Electric into the 21st Century. Takashi Kiuchi

and other forward-thinking businesspeople know that the limits of the earth are ultimately the limits of business. Some of the most highly advanced technologies in the world, the spider's web (five times stronger than steel by weight), the mussel's glue (works under water in the pounding surf), and the human brain, were created using the constraints of The Natural Step. Maybe it's time our engineers and businesspeople used them too.

At Interface, cost-cutting ideas for reducing pollution and waste now come from people in all sectors of the company. Nowhere is this more noticeable than with their top product designer. His newest line of Interface flooring products is manufactured using almost five times fewer resources per unit than standard carpet, yet outperforms all their other carpet lines. The product is assembled on solar-powered looms, is designed to be easily recycled, and is free of any potentially harmful chemicals. Even more unusual, many Interface products can only be leased—they are never bought. Interface services the leased carpets and exchanges any worn sections for new carpet. The worn carpet returns to Interface to be recycled for use in a new Interface product.

Providing services through leasing rather than selling products allows the manufacturer to spend less on raw materials and does not burden the consumer with "stuff" he has no use for beyond the service it provides. Why own carpet when you can lease it at less cost to you and to the earth? What other products can we change into services?

At Mitsubishi Electric, Takashi Kiuchi has combined The Natural Step with the idea that business must not only stop destroying rainforests but also learn how to operate more like the rainforest. His ideas are explained in his new book *The New Economy: Business Lessons from the Rain Forest*.

For example, the rainforest has some of the poorest soils in the world, yet is one of the most productive ecosystems. This is accomplished by application of the principle that "waste equals food." The nutrients do not build up in the soil because they are always becoming food for other organisms. Takashi Kiuchi has taken this lesson from the rainforest and applied it at Mitsubishi Electric in the form of 60 drop-off stations now being built to collect broken electronics (Mitsubishi and all other brands) from consumers. The broken products, once destined for the garbage, have been redefined as food, both as a source of raw materials to build new products and as a source of intellectual, design-food to guide the creation of more durable and recyclable Mitsubishi products. This is ecology, this is smart business.

The Evolution of Ecologically Sound Business—Our Role in the Restorative Economy

The role of environmental NGOs in the New Economy will change, but they will continue to have a vital role in informing consumers and companies. Many companies are still very far from the cutting-edge approach taken by Interface, Mitsubishi Electric and others. When companies fully grasp and incorporate the wisdom of ecology into their business practices, they will not only find that vigilant NGOs are now their allies, but that they have many new opportunities for profit.

NGOs will also have new roles teaming up with businesses to refocus our societies on the true source of human fulfillment.

If we are to give up our wasteful and consumptive lifestyles, what will fill the void? If I

asked any one of you what the single most important thing in your life is, I dare to guess that most of you would talk about your friends and family—the people with whom we share the intimate relationships that are the foundation of our joy and fulfillment in life. Why not devote our energies to this thing that makes us most happy? If we must boast, let it be about the growth of real and heartfelt relationships rather than about abstract economic goals. As we move into the Restorative Economy, our heartfelt goals and economic goals can become one and the same.

Though I have been involved in many important environmental successes in my life, the joy those successes brought me cannot compare with the fulfillment I have experienced from my friends, my children, my grandchildren, and my dear wife of 55 years. Here is a kind of growth that we must have—the growth of love and relationships. This is growth that inherently increases the beauty of all those involved. And upon consulting my 86 years of experience, The Natural Step and other natural laws of life on earth, I foresee no limits to this kind of human growth.

The global threat that environmental problems represent is an opportunity for us to work together and move beyond the old prejudices. Regardless of class, race, nationality, age and sex, we are all together on the Spaceship Earth on which there are no connecting flights, no stops, no finite destinations and no passengers—only crew.

Even if we come together to solve our global problems, we will not always agree on everything. We must foster the ability to disagree and to share our disparate views without the need to dominate and disrespect those who dissent. For the sake of innovation and diversity, we need disagreement; but for the sake of cooperation and stability, we need to have respect for one another.

Like an ecosystem developing from a grassland to a rainforest, our society must grow in its internal complexity and interdependence. In the rainforest, cooperation is more important than competition, which rules in less complex ecosystems. The dead-end alternative is to keep putting more resources into the primitive social structure of domination, hierarchy, and exploitation that is currently so widespread in our institutions.

To have CPR for business, the earth and the human spirit, we must also learn humility. We are relative newcomers to creation. Must it end with us? Or as my friend Bernadette Cozart once said, “Sometimes I think we must be the youngest species on the planet, because everything else seems to know what to do. It might just be that humans are here to learn—not to teach.”

Even as we learn from nature, we must put faith in the human spirit. No country symbolizes this spirit better than Japan. Much innovation has been stimulated simply by the historic isolation and perpetual space constraints of being an island nation. I am hoping that Japan will rediscover its ecological conscience even faster than the United States, owing to the grand traditions of Shinto and the cultural consciousness born of experiencing the limits of an island home—whether it be Honshu or the Island of Mother Earth.

I also hold much hope for Japan’s historical ability to shift out of tired industrial paradigms and make giant advances far before other industrial nations. The Total Quality Management Revolution that Japan started so successfully can be seen as a first step into the

Next Industrial Revolution, one that calls for, as business strategist Gil Friend puts it, “more value, less stuff.” More design intelligence, more information content, more quality-of-life improvements, and less pollution, less resource use and less garbage.

Mitsubishi Electric is moving on from the Quality Revolution to increase the intelligence and value of their products still more by adding ecological information. They have merged their environmental management program into their quality management program, recognizing that a product is not a quality product if it pollutes, disrupts or otherwise degrades the ecosphere. The company is also conducting full environmental accounting, factoring the true cost to the earth and the cost to the future into their business decisions for the first time.

This is a process of business evolution. It is as if we are actually building new DNA codes for more adaptive companies and products that can truly survive the realities of the earth’s sensitivity to human disturbance. Businesses that do not commit to this process of adaptation will eventually die off in the New Economy.

Paul Hawken once wrote, “It is not the environment that needs saving. Business needs saving.” With most human fortunes so tied to business, the process of saving business from undermining the natural basis for its existence is the process of saving the human race from itself. I ask you to join Takashi Kiuchi, Ray Anderson and like-minded leaders in rescuing human society by imagining—then creating—the Restorative Economy that transforms business from the tool of our demise into the means of our survival and future prosperity. From this moment forward, the work we do each day can be an act of creation and restoration that leaves the world and its people more beautiful at the approach of night than it was at dawn.

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