Tools for the Transition to Sustainability

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We must be careful not to succumb to despair, for there is still the odd glimmer of hope.
-Edouard Saouma, 1993

Can we move nations and people in the direction of sustainability? Such a move would be a modification of society comparable in scale to only two other changes: the Agricultural Revolution of the late Neolithic and the Industrial Revolution of the past two centuries. Those revolutions were gradual, spontaneous,and largely unconscious.This one will have to be a fully conscious operation, guided by the best foresight that science can provide.... If we actually do it, the undertaking will be absolutely unique in humanity's stay on the Earth.
-William D. Ruckelshaus.1989

We have been writing about, talk ing about, and working toward sustainability for over three decades now.We have had the privilege of knowing thousands of colleagues in every part of the world who work in their own ways, with their own tal ents, in their own societies toward a sustainable society. When we act at the official, institutional level and when we listen to political leaders, we often feel frustrated.When we work with individuals, we usually feel encouraged.

Everywhere we find folks who care about the earth, about other peo ple, and about the welfare of their children and grandchildren.They recognize the human misery and the environmental degradation around them, and they question whether policies that promote more growth along the same old lines can make things better. Many of them have a feeling, often hard for them to articulate, that the world is headed in the wrong

direction and that preventing disaster will require some big changes.They are willing to work for those changes, if only they could believe their efforts would make a positive difference. They ask: *What can I do? What can governments do? What can corporations do? What can schools, religions, media do? What can citizens, producers, consumers, parents do?*

Experiments guided by those questions are more important than any specific answers, though answers abound. There are "50 simple things you can do to save the planet." Buy an energy-efficient car, for one. Recy cle your bottles and cans, vote knowledgeably in elections–if you are among those people in the world blessed with cars, bottles, cans, or elections. There are also not-so-simple things to do: Work out your own fru gally elegant lifestyle, have at most two children, argue for higher prices on fossil energy (to encourage energy efficiency and stimulate development of renewable energy), work with love and partnership to help one family lift itself out of poverty, find your own "right livelihood," care well for one piece of land, do whatever you can to oppose systems that oppress people or abuse the earth, run for election yourself.

All these actions will help. And, of course, they are not enough. Sus tainability and sufficiency and equity require structural change; they require a revolution, not in the political sense, like the French Revolution, but in the much more profound sense of the agricultural or industrial revolutions. Recycling is important, but by itself it will not bring about a revolution.

What will? In search of an answer, we have found it helpful to try to understand the first two great revolutions in human culture, insofar as historians can reconstruct them.

The First Two Revolutions: Agriculture and Industry

About 10,000 years ago the human population, after millennia of evolu tion, had reached the huge (for the time) number of about 10 million. These people lived as nomadic hunter-gatherers, but in some regions their numbers had begun to overwhelm the once abundant plants and game. To adapt to the problem of dis appearing wild resources they did two things. Some of them intensified their migratory lifestyle.They moved out of their ancestral homes in Africa and the Middle East and populated other areas of the game-rich world.

Others started domesticating animals, cultivating plants, and *staying in one place*. That was a totally new idea. Simply by staying put, the proto farmers altered the face of the planet, the thoughts of humankind, and the shape of society in ways they could never have foreseen.

For the first time it made sense to own land. People who didn't have to carry all their possessions on their backs could accumulate things, and some could accumulate more than others. The ideas of wealth, status, inheritance, trade, money, and power were born. Some people could live on excess food produced by others. They could become full-time tool makers, musicians, scribes, priests, sol diers, athletes, or kings. Thus

arose, for better or worse, guilds, orchestras, libraries, temples, armies, competitive games, dynasties, and cities.

As its inheritors, we think of the agricultural revolution as a great step forward. At the time it was probably a mixed blessing. Many anthropologists think that agriculture was not a better way of life, but a necessary one to accommodate increasing populations. Settled farmers got more food from a hectare than hunter-gatherers did, but the food was of lower nutritional quality and less variety, and it required much more work to produce. Farmers became vulnerable in ways nomads never were to weather, disease, pests, invasion by outsiders, and oppression from their emerging ruling classes. People who did not move away from their own wastes experienced humankind's first chronic pollution.

Nevertheless, agriculture was a successful response to wildlife scarcity. It permitted yet more population growth, which added up over centuries to an enormous increase, from 10 mil lion to 800 million people by 1750. The larger population created new scarcities, especially in land and energy. Another revolution was necessary.

The industrial revolution began in England with the substitution of abundant coal for vanishing trees. The use of coal raised practical problems of earthmoving, mine construction, water pumping, transport, and controlled combustion. These problems were solved relatively quickly, result ing in concentratiom of labor around mines and mills. The process elevated technology and commerce to a prominent position in human soci ety–above religion and ethics.

Again everything changed in ways that no one could have imag ined. Machines, not land, became the central means of production. Feudalism gave way to capitalism and to capitalism's dissenting offshoot, communism. Roads, railroads, factories, and smokestacks appeared on the land scape. Cities swelled. Again the change was a mixed blessing. Factory labor was even harder and more demeaning than farm labor. The air and waters near the new factories turned unspeakably filthy. The stan dard of living for most of the indus trial workforce was far below that of a farmer. But farmland was not avail able; work in a factory was.

It is hard for people alive today to appreciate how profoundly the industrial revolution changed human thought, because that thought still shapes our perceptions. In 1988 histo rian Donald Worster described the philosophical impact of industrialism perhaps as well as any of its inheritors and practitioners can:

"The capitalists… promised that, through the technological domination of the earth, they could deliver a more fair, rational, efficient and pro ductive life for everyone.... Their method was simply to free individual enterprise from the bonds of traditional hierarchy and community, whether the bondage derived from other humans or the earth… That meant teaching everyone to treat the earth, as well as each other, with a frank, energetic, self-assertiveness.... People must… think constantly in terms of making money. They must regard everything around them–the land, its natural resources, their

own labor–as potential commodities that might fetch a profit in the market. They must demand the right to pro duce, buy, and sell those commodities without outside regulation or inter ference.... As wants multiplied, as markets grew more and more far -flung, the bond between humans and the rest of nature was reduced to the barest instrumentalism."[1]

That bare instrumentalism led to incredible productivity and a world that now supports, at varying levels of sufficiency, 6,000 million people–more than 600 times the population existing before the agricultural revolution. Far-flung markets and swelling demands drive environmental exploitation from the poles to the tropics, from the mountaintops to the ocean depths. The success of the industrial revolution, like the previous succeses of hunting-gathering and of agriculture, eventually created its own scarcity, not only of game, not only of land, not only of fuels and metals, but of the total carrying capacity of the global environment. Humankind's ecological footprint had once more exceeded what was sustainable. Success created the necessity for another revolution.

The Next Revolution: Sustainability

It is as impossible now for anyone to describe the world that could evolve from a sustainability revolution as it would have been for the farmers of 6000 BC to foresee the corn and soy bean fields of modern Iowa, or for an English coal miner of AD 1800 to imagine an automated Toyota assem bly line. Like the other great revolu tions, the coming sustainability revolution will also change the face of the land and the foundations of human identities, institutions, and cul tures. Like the previous revolutions, it will take centuries to unfold fully –though it is already under way.

Of course no one knows how to bring about such a revolution. There is not a checklist: "To accomplish a global paradigm shift, follow these 20 steps." Like the great revolutions that came before, this one can't be planned or dictated. It won't follow a list of fiats from government or a proclama tion from computer modelers. The sustainability revolution will be organic. It will arise from the visions, insights, experiments, and actions of billions of people. The burden of making it happen is not on the shoul ders of any one person or group. No one will get the credit, but everyone can contribute.

Our systems training and our own work in the world have affirmed for us two properties of complex sys tems germane to the sort of profound revolution we are discussing here.

First, information is the key to transformation. That does not neces sarily mean *more* information, better statistics, bigger databases, or the World Wide Web, though all of these may play a part. It means *relevant, compelling, select, powerful, timely, accurate* information flowing in new ways to new recipients, carrying new content, suggesting new rules and goals (rules and goals that are themselves infor mation). When its information flows are changed, any system will behave differently. The policy of g*lasnost,* for example–the simple opening of information channels that had long

been closed in the Soviet Union –guaranteed the rapid transformation of Eastern Europe beyond anyone's expectations. The old system had been held in place by tight control of information. Letting go of that con trol triggered total system restructur ing (turbulent and unpredictable, but inevitable).

Second, systems strongly resist changes in their information flows, especially in their rules and goals. It is not surprising that those who benefit from the current system actively oppose such revision. Entrenched political, economic, and religious cliques can constrain almost entirely the attempts of an individual or small group to operate by different rules or to attain goals different from those sanctioned by the system. Innovators can be ignored, marginalized, ridiculed, denied promotions or resources or public voices. They can be literally or figuratively snuffed out.

Only innovators, however–by perceiving the need for new informa tion, rules, and goals, communicating about them, and trying them out –can make the changes that transform systems. This important point is expressed clearly in a quote that is widely attributed to Margaret Mead, "Never deny the power of a small group of committed individuals to change the world. Indeed that is the only thing chat ever has."

We have learned the hard way that it is difficult to live a life of material moderation within a system that expects, exhorts, and rewards consumption. But one can move a long way in the direction of modera tion. It is not easy to use energy efficiently in an economy that produces energy-inefficient products. But one can search out, or if necessary invent, more efficient ways of doing things, and in the process make those ways more accessible to others.

Above all, it is difficult to put forth new information in a system that is structured to hear only old information. Just try, sometime, to question in public the value of more growth, or even to make a distinction between growth and development, and you will see what we mean. It takes courage and clarity to challenge an established system. But it can be done.

In our own search for ways to encourage the peaceful restructuring of a system that naturally resists its own transformation, we have tried many tools. The obvious ones are rational analysis, data gathering, sys tems thinking, computer modeling, and the clearest words we can find. Those are tools that anyone trained in science and economics would auto matically grasp. Like recycling, they are useful, necessary, and they are not enough.

We don't know what will be enough. But we would like to con clude by mentioning five other tools we have found *helpful.* We introduced and discussed this list for the first time in our 1992 book [Beyond the Limits: Confronting Global Collapse, Envisioning *a Sustainable Future].* Our experience since then has affirmed that these five tools are not optional; they are essen tial characteristics for any society that hopes to survive over the long term. We present them here again in our concluding chapter "not as *the* ways to work toward sustainability, but as *some* ways."

“We are a bit hesitant to discuss them,” we said in 1992, “because we are not experts in their use and because they require the use of words that do not come easily from the mouths or word processors of scien tists. They are considered too ‘unscientific’ to be taken seriously in the cynical public arena.”

What are the tools we approached so cautiously?

They are: visioning, networking, truth-telling, learning, and loving.

It seems like a feeble list, given the enormity of the changes required. But each of these exists within a web of positive loops. Thus their persistent and consistent application initially by a relatively small group of people would have the potential to produce enormous change–even to challenge the present system, perhaps helping to produce a revolution.

“The transition to a sustainable society might be helped,” we said in 1992,”by the simple use of words like these more often, with sincerity and without apology, in the information streams of the world.” But we used them with apology ourselves, know ing how most people would receive them.

Many of us feel uneasy about relying on such “soft” tools when the future of our civilization is at stake, particularly since we do not know how to summon them up, in our selves or in others. So we dismiss them and turn the conversation to recycling or emission trading or wildlife preserves or some other nec essary but insufficient part of the sus tainability revolution–but at least a part we know how to handle.

So let’s talk about the tools we don’t yet know how to use, because humanity must quickly master them.

Visioning

Visioning means imagining, at first generally and then with increasing specificity, what you really want. That is, *what you really want,* not what someone has taught you to want, and not what you have learned to be will ing to settle for. Visioning means tak ing off the constraints of “feasibility,” of disbelief and past disappointments, and letting your mind dwell upon its most noble, uplifting, treasured dreams.

Some people, especially young people, engage in visioning with enthusiasm and ease. Some find the exercise of visioning frightening or painful, because a glowing picture of what *could* be makes what *is* all the more intolerable. Some people never admit their visions, for fear of being thought impractical or “unrealistic.” They would find this paragraph uncomfortable to read, if they were willing to read it at all. And some people have been so crushed by their experience that they can only explain why any vision is impossible. That’s fine; skeptics are needed, too. Vision needs to be disciplined by skepticism.

We should say immediately, for the sake of the skeptics, that we do not believe vision

makes anything happen. Vision without action is use less. But action without vision is directionless and feeble. Vision is absolutely necessary to guide and motivate. More than that, vision, when widely shared and firmly kept in sight, does *bring into being new systems*.

We mean that literally. Within the limits of space, time, materials, and energy, visionary human intentions can bring forth not only new infor mation, new feedback loops, new behavior, new knowledge, and new technology, but also new institutions, new physical structures, and new powers within human beings. Ralph Waldo Emerson recognized this profound truth 150 years ago:

"Every nation and every man instantly surround themselves with a material apparatus which exactly cor responds to their moral state, or their state of thought. Observe how every truth and every error, each a thought of some man's mind, clothes itself with societies, houses, cities, language, ceremonies, newspapers. Observe the ideas of the present day… see how each of these abstractions has embod ied itself in an imposing apparatus in the community, and how timber, brick, lime, and stone have flown into convenient shape, obedient to the master idea reigning in the minds of many persons….

It follows, of course, that the least change in the man will change his circumstances; the least enlargement of ideas, the least mitigation of his feelings in respect to other men… would cause the most striking changes of external things."[2]

A sustainable world can never be fully realized until it is widely envi sioned. The vision must be built up by many people before it is complete and compelling. As a way of encour aging others to join in the process, we'll list here some of what we see when we let ourselves imagine a sus tainable society we would like to live in–as opposed to one we would be willing to settle for. This is by no means a definitive list. We include it here only to invite you to develop and enlarge it.

- Sustainability, efficiency, sufficiency, equity, beauty, and community as the highest social values.
- Material sufficiency and security for all. Therefore, by individual choice as well as communal norms, low birth rates and stable populations.
- Work that dignifies people instead of demeaning them. Some way of providing incentives for people to give their best to society and to be rewarded for doing so, while ensuring that everyone will be provided for sufficiently under any circumstances.
- Leaders who are honest, respectful, intelligent, humble, and more inter ested in doing their jobs than in keeping their jobs, more inrerested in serving society than in winning elections.
- An economy that is a means, not an end, one that serves the welfare of the environment, rather than vice versa.
- Efficient, renewable energy systems.
- Efficient, closed-loop materials systems.

- Technical design that reduces emis sions and waste to a minimum, and social agreement not to produce emissions or waste that technology and nature can't handle.
- Regenerative agriculture that builds soils, uses natural mechanisms to restore nutrients and control pests, and produces abundant, un contaminated food.
- The preservation of ecosystems in their variety, with human cultures liv ing in harmony with those ecosys tems; therefore, high diversity of both nature and culture, and human appre ciation for that diversity.
- Flexibility, innovation (social as well as technical), and intellectual chal lenge. A flourishing of science, a con tinuous enlargement of human knowledge.
- Greater understanding of whole systems as an essential part of each person's education.
- Decentralization of economic power, political influence, and scien tific expertise.
- Political structures that permit a balance between short-term and long-term considerations; some way of exerting political pressure now on behalf of our grandchildren.
- High-level skills on the part of citi zens and governments in the arts of nonviolent conflict resolution.
- Media that reflect the world's diver sity and at the same time unite cultures with relevant, accurate, timely, unbiased, and intelligent information, presented in its historic and whole system context.
- Reasons for living and for thinking well of ourselves that do not involve the accumulation of material things.

Networking

We could not do our work without networks. Most of the networks we belong to are informal. They have small budgets, if any, and few of them appear on rosters of world organiza tions.[3] They are almost invisible, but their effects are not negligible. Infor mal networks carry information in the same way as formal institutions do, and often more effectively. They are the natural home of new information, and out of them new system structures can evolve.[4]

Some of our networks are very local, some are international. Some are electronic, some involve people looking each other in the face every day. Whatever their form, they are made up of people who share a common interest in some aspect of life, who stay in touch and pass around data and tools and ideas and encouragement, who like and respect and support each other. One of the most important purposes of a network is simply to remind its members that they are not alone.

A network is nonhierarchical. It is a web of connections among equals, held together not by force, obligation, material incentive, or social contract, but by shared values and the understanding that some tasks can be accomplished together that could never be accomplished separately.

We know of networks of farmers who share organic pest control meth ods. There are

networks of environ mental journalists, “green” architects, computer modelers, game designers, land trusts, consumer cooperatives. There are thousands and thousands of networks that developed as people with common purposes found each other. Some networks become so busy and essential that they evolve into formal organizations with offices and budgets, but most come and go as needed. The advent of the World Wide Web certainly has facilitated and accelerated the formation and main tenance of networks.

Networks dedicated to sustain ability at both the local and the global levels are especially needed to create a sustainable society that har monizes with local ecosystems while keeping itself within global limits. About local networks we can say little here; our localities are different from yours. One role of local net works is to help reestablish the sense of community and relation to place that has been largely lost since the industrial revolution.

When it comes to global net works, we would like to make a plea that they be truly global.The means of participation in international information streams are as badly distributed as are the means of production. There are more telephones in Tokyo, it has been said, than in all of Africa. That must be even more true of computers, fax machines, airline con nections, and invitations to interna tional meetings. But once more the wonder of human inventiveness seems to provide a surprising solution in the form of the Web and cheap access devices.

One could argue that Africa and other underrepresented parts of the world should attend first to their needs for many things other than computers and Web access. We dis agree; the needs of the underprivi leged cannot be effectively communicated, nor can the world benefit from their contributions, unless their voices can be heard. Some of the greatest gains in material and energy efficiency have come in the design of communications equip ment. It is possible within a sustain able ecological footprint for everyone to have the opportunity for global as well as local networking. We must close the “Digital Divide.”

If some part of the sustainability revolution interests you, you can find or form a network of others who share your particular interests. The network will help you discover where to go for information, what publications and tools are available, where to find administrative and financial support, and who can help with specific tasks. The right network will not only help you learn, but also allow you to pass your learning on to others.

Truth-Telling

We are no more certain of the truth than anyone is. But we often know an untruth when we hear one. Many untruths are deliberate, understood as such by both speaker and listeners. They are put forth to manipulate, lull, or entice, to postpone action, to jus tify self-serving action, to gain or pre serve power, or to deny an uncomfortable reality.

Lies distort the information stream. A system cannot function well if its information

streams are cor rupted by lies. One of the most important tenets of systems theory is that information should not be dis torted, delayed, or sequestered.

"All of humanity is in peril," said Buckminster Fuller, "if each one of us does not dare, now and henceforth, always to tell only the truth and all the truth, and to do so promptly right now."[5] Whenever you speak to anyone, on the street, at work, to a crowd, and especially to a child, you can endeavor to counter a lie or affirm a truth. You can deny the idea that having more things makes one a better person. You can question the notion that more for the rich will help the poor. The more you can counter misinformation, the more manageable our society will become.

Here are some common biases and simplifications, verbal traps, and popular untruths that we run into fre quently in discussing limits to growth. We think they need to be pointed out and avoided, if there is ever to be clear thinking about the human economy and its relationship to a finite Earth.

Not: A warning about the future is a prediction of doom.
But: A warning about the future is a recommendation to fol low a different path.

Not: The environment is a luxury or a competing demand or a commodity that people will buy when they can afford it.
But: The environment is the source of all life and every economy. Opinion polls typically show that the public is willing to pay more for a healthy environment.

Not: Change is sacrifice, and it should be avoided.
But: Change is challenge, and it is necessary.

Not: Stopping growth will lock the poor in their poverty.
But: It is the avarice and indifference of the rich that lock the poor into poverty.The poor need new attitudes among the rich: then there will be growth specifically geared to serve their needs.

Not: Everyone should be brought up to the material level of the richest countries.
But: There is no possibility of raising material consumption levels for everyone to the levels now enjoyed by the rich. Everyone should have their fundamental material needs satisfied. Material needs beyond this level should be satisfied only if it is possible, for all, within a sustainable ecological footprint.

Not: All growth is good, without question, discrimination, or investigation.
Nor: All growth is bad.
But: What is needed is not growth, but development. Insofar as development requires physical expansion, it should be equitable, affordable, and sustainable, with all real costs counted.

Not: Technology will solve all problems.
Nor: Technology does nothing but cause problems.
But: We need to encourage technologies that will reduce the ecological footprint,

increase efficiency, enhance resources, improve signals, and end material deprivation.
And: We must approach our problems as human beings and bring more to bear on them than just technology.

Not: The market system will automatically bring us the future we want.
But: We must decide for ourselves what future we want. Then we can use the market system, along with many other organizational devices, to achieve it.

Not: Industry is the cause of all problems, or the cure.
Nor: Government is the cause or the cure.
Nor: Environmentalists are the cause or the cure.
Nor: Any other group [economists come to mind] is the cause or the cure.
But: All people and institutions play their role within the large system structure. In a system that is structured for overshoot, all players deliberately or inadvertently contribute to that overshoot. In a system that is structured for sustainability, industries, governments, environmentalists, and most especially economists will play essential roles in contributing to sustainability.

Not: Unrelieved pessimism.
Nor: Sappy optimism.
But: The resolve to tell the truth about both the successes and failures of the present and the potentials and obstacles in the future.
And above all: The courage to admit and bear the pain of the present, while keeping a steady eye on a vision of a better future.

Not: The World3 model, or any other model, is right or wrong.
But: All models, including the ones in our heads, are a little right, much too simple, and mostly wrong. How do we proceed in such a way as to test our models and learn where they are right and wrong? How do we speak to each other as fellow modelers with an appropriate mixture of skepticism and respect? How do we stop playing right-wrong games with each other and start designing right-wrong tests for our models against the real world?

The last challenge, sorting out and testing models, brings us to the topic of learning.

Learning

Visioning, networking, and truth-telling are useless if they do not inform action. There are many things to do to bring about a sustainable world. New farming methods have to be worked out. New businesses have to be started and old ones have to be redesigned to reduce their footprint. Land has to be restored, parks protected, energy systems transformed, international agreements reached. Laws have to be passed and others repealed. Children have to be taught, and so do adults. Films have to be made, music played, books published. Web sites established, people counseled, groups led, subsidies removed, sustainability indicators developed, and prices corrected to portray full costs.

All people will find their own best role in all this doing. We wouldn't presume to prescribe a specific role for anyone but ourselves. But we would make one suggestion: Whatever you do, do it humbly. Do it not as immutable policy, but as experiment. Use your action, whatever it is, to learn.

The depths of human ignorance are much more profound than most of us are willing to admit. This is especially so at a time when the global economy is coming together as a more integrated whole than it has ever been, when that economy is pressing against the limits of a won drously complex planet, and when wholly new ways of thinking are called for. At this time, no one knows enough. No leaders, no matter how authoritative they pretend to be, understand the situation. No policy should be imposed wholesale upon the whole world. If you cannot afford to lose, do not gamble.

Learning means the willingness to go slowly, to try things out, and to collect information about the effects of actions, including the crucial but not always welcome information that the action is not working. One can't learn without making mistakes, telling the truth about them, and moving on. Learning means exploring a new path with vigor and courage, being open to other people's explorations of other paths, and being willing to switch paths if one is found that leads more directly to the goal.

The world's leaders have lost both the habit of learning and the freedom to learn. Somehow a politi cal system has evolved in which the voters expect leaders to have all the answers, that assigns only a few peo ple to be leaders, and that brings them down quickly if they suggest unpleasant remedies. This perverse system undermines the leadership capacity of the people and the learn ing capacity of the leaders.

It's time for us to do some truth telling on this issue. The world's lead ers do not know any better than anyone else how to bring about a sus tainable society; most of them don't even know it's necessary to do so. A sustainability revolution requires each person to act as a learning leader at some level, from family to community to nation to world. And it requires each of us to support leaders by allowing them to admit uncer tainty, conduct honest experiments, and acknowledge mistakes.

No one can be free to learn without patience and forgiveness.But in a condition of overshoot, there is not much time for patience and forgive ness. Finding the right balance between the apparent opposites of urgency and patience, accountability and forgiveness is a task that requires compassion, humility, clearheadedness, honesty, and–that hardest of words, that seem ingly scarcest of all resources–love.

Loving

One is not allowed in the industrial culture to speak about love, except in the most romantic and trivial sense of the word. Anyone who calls upon the capacity of people to practice broth erly and sisterly love, love of humanity as a whole, love of nature and of our nurturing planet, is more likely to be ridiculed than to be taken seriously. The deepest difference between opti mists and pessimists is their position in the debate

about whether human beings are able to operate collectively from a basis of love. In a society that systematically develops individualism, competitiveness, and short-term focus, the pessimists are in the vast majority.

Individualism and shortsighted ness are the greatest problems of the current social system, we think, and the deepest cause of unsustainability. Love and compassion institutionalized in collective solutions is the better alternative. A culture that does not believe in, discuss, and develop these better human qualities suffers from a tragic limitation in its options."How good a society does human nature permit?" asked psychologist Abraham Maslow. "How good a human nature does society permit?"[6]

The sustainability revolution will have to be, above all, a collective transformation that permits the best of human nature, rather than the worst, to be expressed and nurtured. Many people have recognized that necessity and that opportunity. For example, John Maynard Keynes wrote in 1932:

"The problem of want and poverty and the economic struggle between classes and nations is nothing but a frightful muddle, a transitory and unnecessary muddle. For the Western World already has the resource and the technique, if we could create the organization to use them, capable of reducing the Eco nomic Problem, which now absorbs our moral and material energy, to a position of secondary importance....

Thus the... day is not far off when the Economic Problem will take the back seat where it belongs, and... the arena of the heart and head will be occupied... by our real problems– the problems of life and of human relations, of creation and behaviour and religion."[7]

Aurelio Peccei, the great industrial leader who wrote constantly about problems of growth and limits, eco nomics and environment, resources and governance, never failed to con clude that the answers to the world's problems begin with a "new human ism." In 1981 he expressed this view:

"The humanism consonant with our epoch must replace and reverse principles and norms that we have heretofore regarded as untouchable, but that have become inapplicable, or discordant with our purpose; it must encourage the rise of new value sys tems to redress our inner balance, and of new spiritual, ethical, philosophical, social, political, aesthetic, and artistic motivations to fill the emptiness of our life; it must be capable of restor ing within us... love, friendship, understanding, solidarity, a spirit of sacrifice, conviviality; and it must make us understand that the more closely these qualities link us to other forms of life and to our brothers and sisters everywhere in the world, the more we shall gain."[8]

lt is not easy to practice love, friendship, generosity, understanding, or solidarity within a system whose rules, goals, and information streams are geared for lesser human qualities. But we try, and we urge you to try. Be patient with yourself and others as you and they confront the difficulty of a changing world. Understand and empathize with inevitable resistance; there is resistance, some clinging to the ways of unsustainability,

within each of us. Seek out and trust in the best human instincts in yourself and in everyone. Listen to the cynicism around you and have compas sion for those who believe in it, but don't believe it yourself.

Humanity cannot triumph in the adven ture of reducing the human footprint to a sustainable level if that adventure is not under taken in a spirit of global partnership. Collapse cannot be avoided if people do not learn to view themselves and others as part of one integrated global society. Both will require compassion, not only with the here and now, but with the distant and future as well. Humanity must learn to love the idea of leaving future generations a living planet.

Is anything we have advocated here, from more resource efficiency to more compassion, really possible? Can the world actually ease down below the limits and avoid collapse? Can the human footprint be reduced in time? Is there enough vision, technology, freedom, community, responsibility, foresight, money, discipline, and love, on a global scale?

Of all the hypothetical questions we have posed in this book, these are the most unanswerable, though many people will pretend to answer them. Even we–your authors–differ among ourselves when tallying the odds for and against.The ritual cheer fulness of many uninformed people, especially world leaders, would say the questions are not even relevant; there are no meaningful limits. Many of the informed are infected with the deep cynicism that lies just under the ritual public cheerfulness. They would say that there are severe problems already, with worse ones ahead, and that there's not a chance of solving them.

Both of those answers are based, of course, on mental models. The truth of the matter is that *no one knows*.

We have said many times that the world faces not a preordained future, but a choice. The choice is between different mental models, which lead logically to different scenarios. One mental model says that this world for all practical purposes has no limits. Choosing that mental model will encourage extractive business as usual and take the human economy even farther beyond the limits. The result will be collapse.

Another mental model says that the limits are real and close, and that there is not enough time, and that people cannot be moderate or responsible or compassionate. At least not in time. That model is self-fulfilling. If the world's people choose to believe it, they will be proven right. The result will be collapse.

A third mental model says that the limits are real and close and in some cases below our current levels of throughput. But there is just enough time, with no time to waste. There is just enough energy, enough material, enough money, enough environmental resilience, and enough human virtue to bring about a planned reduction in the ecological footprint of humankind: a sustainabil ity revolution to a much better world for the vast majority.

That third scenario might very well be wrong. But the evidence we have seen, from world data to global computer models, suggests that it could conceivably be made right. There is no way of knowing for sure, other than to try it.

Footnotes

1. Donald Worster, editor, *The Ends of the Earth* (Cambridge: Cambridge University Press, 1988), 11-12.

2. Ralph Waldo Emerson. Lecture on "War," delivered in Boston, March 1838. Reprinted in *Emerson's Complete Works, vol. 11* (Boston: Houghton Mifflin, 1887), 177.

3. Examples of networks known to the authors and in their field of interest are the Balaton Group (www.unh.edu/ipssr/Balaton.html), Northeast Organic Farming Associa tion (NOFA), Center for a New American Dream (CNAD: www.newdream.org), Greenlist (www.peacestore.us/Public/Green list), Greenclips (www.greenclips.com), Northern Forest Alliance (www.northernfore stalliance.org), Land Trust Alliance (www.lta.org), International Simula tion and Gaming Association (ISAGA: www.isaga.info), and Leader ship for Environment and Develop ment (LEAD).

4. Such an intermediate step is illus trated by ICLEI, an international association of (currently 450) local governments implementing sustain able development. See www.iclei.org.

5. R.Buckminster Fuller, *Critical Path* (New York: St.Martin's Press, 1981).

6. Abraham Maslow, *The Farthest Reaches of Human Nature* (New York: Viking Press, 1971).

7. J. M.Keynes, foreword to *Essays in Persuasion* (New York: Harcourt Brace. 1932).

8. *Aurelio Peccei, One Hundred Pages for the Future* (New York: Pergamon Press, 1981), 184-185.