

## Four Challenges of Sustainability

The destiny of the human species is to choose a truly great but brief, not a long and dull career.

Nicholas Georgescu-Roegen  
(1971)

The concept of sustainability first came to public notice in Wes Jackson's work on agriculture in the late 1970s, in Lester Brown's *Building a Sustainable Society* (1980), and in *The World Conservation Strategy* (Allen 1980). The Brundtland Commission (1987) made it a central feature of its 1987 report, defining it as meeting the needs of the present generation without compromising the ability of future generations to do the same. Their definition confused sustainable growth, an oxymoron, and sustainable development, a possibility. Ambiguities notwithstanding, the concept of sustainability has become the keystone of the global dialogue about the human future. But what exactly do we intend to sustain and what will that require of us?

Such questions would have had little meaning to generations prior to, say, 1950, when nuclear annihilation became possible. Other than a collision between Earth and a large meteor there was no conceivable way that civilization everywhere could have been radically degraded or terminated. But now any well-informed high school student could make a long list of ways in which humankind could cause its own demise. The dialogue about sustainability is about a change in the human trajectory that will require us to rethink old assumptions and engage the large questions of the human condition that some presume to have been answered once and for all.

The things that cannot be sustained are clear. The ongoing militarization of the planet along with the greed and hatred that feeds it are not sustainable. Sooner or later a roll of the dice will come up Armageddon—whether on the Indian subcontinent or in the Middle East—by an accidental missile launch or by an act of a rogue state or terrorists. A world with a large number of desperately poor people cannot be sustained because they have power to disrupt the lives of the comfortable in ways that we are only beginning to appreciate; such a world is not worth sustaining anyway. The perpetual enlargement of the human estate cannot be sustained because it will eventually overwhelm the capacity and fecundity of natural systems and cycles. The unrestrained development of any and all technology cannot be sustained without courting risks and adversity that we often see only in hindsight. A world of ever-increasing economic, financial, and technological complexity cannot be sustained because sooner or later it will overwhelm our capacity to manage it. A world divided by narrow, exclusive, and intense allegiances to ideology or ethnicity cannot be sustained because its people will have too little humor, compassion, forgiveness, and wisdom to save themselves. Unrestrained automobile, hedonism, individualism, and conspicuous consumption cannot be sustained because they take more than they give back. A spiritually impoverished world is not sustainable because meaninglessness, anomie, and despair will corrode our desire to sustain it and the belief that humanity is worth sustaining. But these are the very things that dis-

tinguish the modern age from its predecessors. Genuine sustainability, in other words, will come not from superficial changes but from a deeper process akin to humankind growing to a fuller stature.

The question, then, is not whether we will change, but whether the transition will be done with more or less grace and whether the destination is desirable or not. The barriers to a graceful transition to sustainability, whatever forms it may take, are not so much technological as they are social, political, and psychological. It is possible that we will be paralyzed by information overload leading to a kind of psychic numbness (de Zengotita 2002). It is possible that we will suffer what Thomas Homer-Dixon (2000) calls an "ingenuity gap," in which problems outrun our problem-solving capacities. It is possible that the sheer scale and complexity of human systems will become utterly unfathomable and hence unmanageable. It is possible that we will fail to comprehend the nature of nature sufficiently to know how to live well on the earth in large numbers. It is possible that we will fail to make a smooth transition because of political ineptitude and a lack of leadership and/or because power is co-opted by corporations and private armies. It is possible that we will fail because the powers of denial and wishful thinking cause us to underestimate the magnitude of our problems and to overlook better possibilities. And it is possible that we will fail because of what can only be called a condition of spiritual emptiness. The challenges of sustainability come hard on the heels of a century in which perhaps as many as 200 million people were killed in

wars, ethnic conflicts, and extermination camps, taking a psychic toll that we understand only dimly.

On the other hand it is possible, and I think likely, that the challenge of survival is precisely what will finally bring humankind together in the realization of the fragility of civilization and the triviality of most of our causes relative to this one central issue. The overall challenge of sustainability is to avoid crossing irreversible thresholds that damage the life systems of Earth while at the same time to create long-term economic, political, and moral arrangements that secure the well-being of present and future generations. We will have to acknowledge that the Enlightenment's faith in human reason is, in some measure, misplaced. But this does not indicate a need for less enlightenment but rather for an enlightenment tempered by the recognition of human fallibility—a more rational kind of reason. In this light the great discovery of the modern era is not how to make nuclear fire, alter our genes, or communicate at the speed of light but rather the discovery of our interconnectedness in the web of life. What Thomas Berry calls the "Great Work" of the twenty-first century will be to comprehend what that awareness means in every area of life in order to calibrate human demands with what the earth can sustain. Broadly speaking, the transition to sustainability poses four challenges.

First, we need more accurate models, metaphors, and measures to describe the human enterprise relative to the biosphere. We need a compass that defines true north for a civilization long on means and short on direction. On the one hand the conventional wisdom describes us as masters of the planet, destined to become ever more numerous and rich without explaining how this is possible or why it might be desirable. In contrast, Howard and Elisabeth Odum (2001:5) argue, for example, "that many, if not all, of the systems of the planet have common proper-

ties, organize in similar ways, have similar oscillations over time, have similar patterns spatially, and operate within universal energy laws." From the perspective of systems ecology, the efflorescence of humanity in the twentieth century is evidence of a natural pulsing. But having exhausted much of the material basis for expansion (p. 85), like other systems, we are entering a down cycle, a "long process of reorganizing to form a lesser economy on renewable resources" before another upward pulse (p. 8). The pattern of growth and retreat that the Odums find in all systems stands in marked contrast to the rosy assumptions of perpetual economic growth, as do the prescriptions that follow. For the Odums, smart policy would include plans for a prosperous descent, to avoid an otherwise catastrophic collapse. The specific tasks they propose are to "stabilize capitalism, protect the Earth's production of real wealth, and develop equity among nations" (p. 133).

Archeologist Joseph Tainter (1988:194) proposes a similar model based on the rise and collapse of complex societies. Collapse eventually occurs when "investment in sociopolitical complexity. . . reaches a point of declining marginal returns." In Tainter's view, this is "not a fall to some primordial chaos, but a return to the normal human condition of lower complexity" (p. 198). He believes that patterns of declining marginal returns are now evident in some contemporary industrial societies in areas of agriculture, minerals and energy production, research, health care, education, and military and industrial management. Like the Odums, Tainter regards expansion and contraction as parts of a normal process. But how might we know whether we are in one phase or the other? The answer requires better accounting tools that relate human wealth generation to some larger measure of biophysical wealth. The Odums (2001:67) propose the concept of "emergy" or what they de-

fine as "the available energy of one kind that has to be used up directly and indirectly to make a product or service." By their accounting, the amount of embodied energy in solar equivalent units gives a more accurate picture of our relative wealth than purely financial measures. Others are developing different tools to the same purpose of including natural capital otherwise left out of purely economic accounting.

Second, the transition to sustainability will require a marked improvement and creativity in the arts of citizenship and governance (Carley & Christie 2000). There are some things that can be done only by an alert citizenry acting with responsive and democratically controlled governments. Only governments moved by an ethically robust and organized citizenry can act to ensure the fair distribution of wealth within and between generations. Only governments prodded by their citizens can act to limit risks posed by technology or clean up the mess afterward. Only governments and an environmentally literate public can choose to adopt and enforce standards that move us toward a cradle-to-cradle materials policy. Only governments acting on a public mandate can license corporations and control their activities for the public benefit over the long term. Only governments can create the financial wherewithal to rebuild ecologically sound cities and dependable public transportation systems. Only governments acting with an informed public can set standards for the use of common property resources, including air, water, wildlife, and soil. And only governments can implement strategies to create the resilience that enables societies to withstand unexpected disturbances. Resilience means dispersed rather than concentrated assets, control, and capacity. A resilient society, for instance, would have widely dispersed manufacturing, many small farms, many small cities and towns, greater self-reliance, and few if any technologies

vulnerable to catastrophic failure, acts of God, or human malice. Sustainability, in short, is constituted by a series of public choices that require effective institutions of governance and a well-informed, democratically engaged citizenry.

The third challenge, then, is to inform the public through greatly improved education. The kind of education needed for the transition to sustainability, however, has little to do with improving SAT or GRE scores or advancing skills necessary to an expansionist phase of human culture. "During growth," in the Odums' (2001:258) words, "emphasis was on getting new information . . . but as resource availability declines, emphasis [will be] on efficiency in teaching information that we already have." They suggest a curriculum organized around the study of the relationships between energy, environment, and economics and how these apply across various scales of knowledge. Students of all ages will need the kind of education and skills appropriate to building a society with fewer cars but more bicycles and trains; fewer large power plants but more windmills and solar collectors; fewer supermarkets and more farmers' markets; fewer large corporations and more small businesses; less time for leisure but more good work to do; and less public funding but more public spirit. From the Odum's perspective this is a generation that must foster the regeneration of the natural capital of soils, forests, watersheds, and wild areas; clean up the toxic messes from the expansionist phase; restore sustainably habitable cities; relearn the practices of good farming; and learn the arts of powering civilization on efficiency and sunlight. Education appropriate to the future will require the courage to provide "intellectual leadership for the long-run" based on a clear understanding of where we stand relative to larger cycles and trends (p. 262).

It is easy, however, to offer long lists of solutions and still not solve

the larger problem. The difficulty, once identified by E. F. Schumacher (1977), is that human problems, such as those posed by the transition to sustainability, are not solvable by rational means alone. These are what he called "divergent" problems formed out of the tensions between competing perspectives that cannot be solved but can be transcended. In contrast to "convergent" problems that can be solved by logic and method, divergent problems can be resolved only by higher methods of wisdom, love, compassion, understanding, and empathy. The logical mind does not much like divergent problems because it operates more easily with "either/or, or yes/no . . . like a computer" (Schumacher 1977).

Recognizing the challenge of sustainability as a series of divergent problems leads to the fourth and most difficult challenge of all. The transition to sustainability will require learning how to recognize and resolve divergent problems, which is to say a higher level of spiritual awareness. By whatever name, something akin to spiritual renewal is the *sine qua non* of the transition to sustainability. Scientists in a secular culture are often uneasy about matters of spirit, but science on its own can give no reason for sustaining humankind. It can, with equal rigor, create the knowledge that will cause our demise or that will allow us to live at peace with one another and nature. But the spiritual acumen necessary to solve divergent problems posed by the transition to sustainability cannot be achieved with a return to some simplistic religious faith of an earlier time. It must be founded on a higher order of awareness that honors mystery, science, life, and death.

Specifically, the kind of spiritual renewal essential to sustainability must enable us to forgive the terrible wrongs at the heart of the bitter ethnic and national rivalries of past centuries and move on. No convergent logic or scientific solution will en-

able us to transcend self-perpetuating hatreds and habitual violence. The only solution to this divergent problem is a profound sense of forgiveness and mercy that rises above the convergent logic of justice. The spiritual renewal necessary for the transition must provide convincing grounds on which humankind can justify the project of sustainability. We are, in Lynn Margulis's (1998:149) words, "upright mammalian weeds." But is this all that we are or all that we can be? If so, we have little reason to be sustained beyond the sheer will to live. Perhaps this is enough, but I doubt it. A robust spiritual sense may not mean that we are created in the image of God, but it must offer hope that we may grow into something more than a planetary plague. A robust spirituality must help us go deeper to resolve what Ernest Becker (1973:ix) once described as the "terror of death" that "haunts the human animal like nothing else." The effort to deny the reality of our death, he believed, serves as "a mainspring of human activity," including much that we now see cannot be sustained. "Modern man is drinking and drugging himself out of awareness or he spends his time shopping, which is the same thing" (p. 284). "Taking life seriously," he wrote, "means that whatever man does on this planet has to be done in the lived truth of the terror of creation, of the grotesque, of the rumble of panic underneath everything." In words written shortly before his own death, Becker concluded that "The urge to cosmic heroism, then, is sacred and mysterious and not to be neatly ordered and rationalized by science and secularism" (p. 284). No culture has gone farther than our own to deny individual mortality, and in its denial it is killing the planet. A spirituality that allows us to face our own mortality honestly without denial or terror contains the seeds of the daily heroism necessary to preserve life on Earth. Instead of terror, a deeper spirituality would lead us to a place

of gratitude and celebration. It would also energize us to act. Will we be able to act in the time available? Caught between complacency and despair, E. F. Schumacher (1977:140) thought it advisable "to leave these perplexities behind us and get down to work."

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