

CHAPTER 4

THE PERPETUAL BALANCING ACT: ECONOMICS, TECHNOLOGY, AND ECOLOGICAL SUPPORT SYSTEMS

Before the agricultural and industrial revolutions, the life support system for humans was entirely ecological. However, present population size, distribution (highly urban), and level of affluence have made humans dependent on both a technological and biospheric life support system. The perception of close ties between human well being and the health of the technological/economic system has diminished the concern for the health of ecosystems that furnish services upon which human survival depends. Many people feel that those attempting to preserve and restore ecosystem integrity are more interested in the well being of owls, lemurs, and wolves than other humans. Perhaps some are, but this fact does not lessen human dependence on the planet's biospheric life support system.

Some economists and others believe that technology has made obsolete such concepts as carrying capacity and limits to growth. Technological innovations such as fertilizer, irrigation, highly mechanized agriculture, elevators (permitting more people on a finite amount of the planet's surface) and air conditioning have permitted an expansion of both population and affluence that did not seem possible earlier. However, these innovations have come at an enormous price—the diminution of natural capital (e.g., topsoil, old growth forests, clean air and water, and so on). Such rapid growth is unsustainable. Furthermore, technology has been used to circumvent or delay policy development. For example, a US political decision on limiting greenhouse gases that produce global warming has been based more on technology than reducing dependence upon fossil fuels. Reducing resource consumption and the size of ecological footprints have not been given serious attention in the US, which has a large ecological footprint and consumes 25% of the world's resources, although the US represents only 4% of the planet's human population.

The US Great Depression resulted when the economic system suffered severe reverses, and, with far less money to buy its products, the technological system also declined. By comparison with many other people of my age, the Depression had comparatively little effect on me personally because my father remained employed. As a freight solicitor, his salary was almost certainly adversely affected because the economy was devastated and, therefore, the shipments, such as steel, lumber, and grain were definitely reduced. Nevertheless, I was always adequately fed, had adequate medical care for those times, and remained in our house with sufficient heat. My father worked in an office in Philadelphia, but he traveled a good deal to where the shipments were. As a consequence, my family was better situated than many other people. The parents of many of my contemporaries were unemployed or laid off from time to time from their businesses, such as clothing shops, barbershops, and food markets, and had relatively little money.

Economic matters of the time, such as who was working and who was not, and whether things would improve or continue to deteriorate economically were openly and exhaustively discussed. These topics were matters of considerable interest to me because continuously I could see the consequences to the people whom I knew well. Entire families listened to US President Franklin D. Roosevelt's "fireside" chats on the radio. These programs were discussed in considerable detail and were often accompanied by heated disagreements and arguments for days afterwards. This situation was the "real world," not what was shown on the movie screen on Saturday. The valuable lessons for the children of that era were that all opinions were not equally valid and that unpleasant consequences often resulted from errors in judgment. However, the biospheric life support system was never discussed.

One of the lessons I gleaned from the adult conversations was that things were pretty good between World War I and the Depression and that *the latter arrived unexpectedly for everyone*. From that time on, one was to assume that, no matter how good times were, things could deteriorate quickly and good sense dictated being prepared for bad conditions. Preparation for bad times could be accomplished by not accumulating too much debt; by always saving a portion of one's income,

however meager; and by sacrificing high income to seek employment that was comparatively resistant to bad times, such as education or delivery of essential services. In contrast, others believed in spending money as fast as it arrived, because depositing it in a bank was risky since banks had failed. An extension of this view was that, if one lived for the moment and did not save for bad times, the government would eventually take care of those in need. The current extraordinary level of credit card debt in the 21st century seems to support this view.

A second memorable event for many people in my generation, particularly those on the East Coast of the United States, was the New York World's Fair of 1939. The message of the World's Fair was unmistakable—technology would solve all problems! It would provide endless comforts and jobs, while simultaneously reducing human physical labor. Instead of smoky, grimy industrial cities, people would live in sparkling new dwellings with glamorous transportation readily available, and, most important, all these advancements would be available to ordinary citizens. We high school students visiting the Fair were ecstatic that the future held all these utopian vistas for us; who were we to doubt the appearance of these technological marvels after seeing them at the Fair? The long-term lesson from this glimpse of the future was unmistakable—do not place too much faith in unproven technology.

Along the same lines, World War II boosted faith in technology enormously. A relatively large portion of the American Pacific fleet was sunk at Pearl Harbor on December 7, 1941. Just a few years later, armadas that stretched from horizon to horizon retook the islands taken by the Japanese after Pearl Harbor. These enormous armadas represented only a portion of the resources available, since the war in Europe took priority. Suddenly, everyone was working, either producing or using the products of a technological system. Moreover, American technology was the best and produced not only enough for Americans but for the Allies as well. Nowhere was this more evident than in the Pacific theater where small islands, such as Iwo Jima and Tarawa, were literally surrounded in depth by American technology.

This awe of technology continued after World War II when quality, low-cost housing (although often in homogenous tracts) became more generally available for more people than ever before. Practically every family had at least one automobile, and food was abundant at relatively inexpensive prices.

With these events from history as a background, I was shocked when I joined the river survey team at the National Academy of Sciences and saw, first hand, the downside of technology (i.e., pollution). I was suddenly confronted with the effluvia of industrial and municipal systems at a huge number of locations in an entire drainage basin not all that distant from where I grew up. I realized quickly that the technological system, which had given so many people “the good life,” could also destroy, or seriously abuse, ecological systems. I had felt an affinity for natural systems my entire life, and my educational experiences had enabled me to appreciate them even more. The systems were far more complex than I ever imagined and far more vulnerable than I had ever dreamed. Although many years passed before I first encountered Aldo Leopold's statement that to be an ecologist was to live in a world of wounds, my academic experience had heightened my awareness of ecological damage to a far greater degree than that of my fellow citizens. This dichotomy of the co-existence of natural systems and technology exists to this day. Some years ago, a colleague, who has a deep respect for the interdependent web of life, gestured toward the view of a typical upper middle class neighborhood from a building where we were meeting. New, well cared for homes were each on separate plots of land and surrounded by well kept lawns and various ornamental vegetation, mostly non-indigenous species. In the distance were mountains consisting of second- or third-growth forests. My friend commented, looking at this view, that one would never guess there were environmental problems. I told him that, to the contrary, what I saw was an enormous increase in impervious surfaces (roads, parking lots, roofs, and driveways), lawns that required fertilizers and pesticides to maintain the monoculture, and enormous expenditures of energy to keep the grass trimmed. Furthermore, per capita energy use was high for air conditioners, heating, transportation, and grass cutting, not to mention development of roads, sewer lines, and other development needs. My viewpoint was the result of observing ecological damage elsewhere

that first produced and then maintained this misleadingly idyllic setting. Not long after that conversation, I heard him speaking against increasing the size of a parking lot that would add to the impervious surfaces of the area. He, too, now lives in a world of wounds, and I sometimes wonder if I should not have spoken. Neither of us will likely live long enough to witness environmental protection and repair that exceeds environmental destruction and damage.

Fortunately, my spouse Jean shared my love of nature, so we lived (until 2000) on an 8.5-acre hillside tract covered almost entirely by trees. Our 22-foot x 44-foot two-story house was surrounded by trees (with no lawn) and was reached by a narrow gravel driveway. The hillside was so steep and the trees so close that a view from second-floor windows gave the impression of being in a tree house, which our children frequently noted. Trees fell, hit the house, and damaged the roof. A friend removed trees that fell on the driveway and used the wood for fuel in his stove. Otherwise, the dead trees stood for our woodpecker friends, and trees felled by ice storms and high winds stayed on the ground to provide habitat for other creatures. In terms of space, all but a tiny portion of our 8.5 acres was for all other creatures. If it were not for the very noisy truck traffic on a nearby bypass and the lights of the other houses at night, we could imagine nature to be dominant. Since my wife and I were then both 77 years old and since ice storms had left us without power for as much as a week, our time in such continuous, close contact with nature was nearly over. However, we remained as long as we could because it gave the illusion of living in a different world than the one we actually inhabited.

I am convinced that humankind's present addiction to technology and exponential growth is suicidal for human society. Technology helps control my blood pressure and asthma and provides many amenities; however, it is simultaneously both a danger and an opportunity. I share Speth's (2004) belief that, if Americans grasped the full dimensions of the global environmental crisis, they might rise to the challenge and first diminish and then reverse the present rate of environmental damage, which they have caused even far beyond their own borders. Both US political parties give only "lip service" to the environmental crisis, so effective remedial action is minimal. Humankind is acting as if it is immune to the laws of nature that affect all species on the planet. Sustainable use of the planet will require extraordinary changes in civilian, corporate, and governmental behavior and practices. Human society is still enamored of perpetual economic/technological growth on a finite planet. The decades of robust scientific evidence on the deleterious effects of unrestrained economic/technological growth are largely ignored. I can only hope that this disregard will change.

I entered the field of environmental biology over half a century ago. Although many success stories can be noted, the condition of the global biospheric life support system has dramatically worsened. New, major concerns have emerged, such as global climate change. In addition, the human population is expected to increase by 3 billion in the first half of the 21st century. In 1948, science was respected; at present, it is being distorted to conform to political ideologies. Scientists, including many Nobel laureates and members of the US National Academy of Sciences, have protested this misuse of science without substantively diminishing the misuse. At least one major environmental catastrophe may be needed to cause a major change in human behavior. Individuals who flagrantly misuse science must be publicly discredited in order to avoid future problems resulting from misuse of science. Only then will living sustainably have at least a chance.

Reference

Speth, J. G. 2004. *Red Sky at Morning: America and the Crisis of the Global Community*. Yale University Press, New Haven, CT.