

FOR MY FATHER AND MOTHER

EARTH IN MIND

On Education, Environment,
and the Human Prospect



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INTRODUCTION

FROM newspapers, journal articles, and books, the following random facts crossed my desk within the past month:

- Male sperm counts worldwide have fallen by 50% since 1938, and no one knows exactly why.
- Human breast milk often contains more toxins than are permissible in milk sold by dairies.
- At death, human bodies often contain enough toxins and heavy metals to be classified as hazardous waste.
- Similarly toxic are the bodies of whales and dolphins washed up on the banks of the St. Lawrence River and the Atlantic shore.
- There has been a marked decline in fungi worldwide, and no one knows why.
- There has been a similar decline in populations of amphibians worldwide, even where the pH of rainfall is normal.
- Roughly 80% of European forests have been damaged by acid rain.
- U.S. industry releases some 11.4 billion tons of hazardous wastes to the environment each year.
- Ultraviolet radiation reaching the ground in Toronto is now increasing at 5% per year.

These facts only appear to be random. In truth, they are not random at all but part of a larger pattern that includes shopping malls and deforestation, glitzy suburbs and ozone holes, crowded freeways and climate change, overstocked supermarkets and soil erosion, a gross national product in excess of \$5 trillion and superfund sites, and technological wonders and insensate violence. In reality there is no such thing as a "side

effect” or an “externality.” These things are threads of a whole cloth. The fact that we see them as disconnected events or fail to see them at all is, I believe, evidence of a considerable failure that we have yet to acknowledge as an educational failure. It is a failure to educate people to think broadly, to perceive systems and patterns, and to live as whole persons.

Much of the current debate about educational standards and reforms, however, is driven by the belief that we must prepare the young only to compete effectively in the global economy. That done, all will be well, or so it is assumed. But there are better reasons to reform education, which have to do with the rapid decline in the habitability of the earth. The kind of discipline-centric education that enabled us to industrialize the earth will not necessarily help us heal the damage caused by industrialization. Yale University historian Paul Kennedy (1993), after surveying the century ahead, reached broadly similar conclusions, calling for “nothing less than the re-education of humankind” (p. 331).

Yet we continue to educate the young for the most part as if there were no planetary emergency. It is widely assumed that environmental problems will be solved by technology of one sort or another. Better technology can certainly help, but the crisis is not first and foremost one of technology. Rather, it is a crisis within the minds that develop and use technology. The disordering of ecological systems and of the great biogeochemical cycles of the earth reflects a prior disorder in the thought, perception, imagination, intellectual priorities, and loyalties inherent in the industrial mind. Ultimately, then, the ecological crisis concerns how we think and the institutions that purport to shape and refine the capacity to think.

The essays in this book were written for different purposes and different audiences between 1990 and 1993. They are joined by the belief that the environmental crisis originates with the inability to think about ecological patterns, systems of causation, and the long-term effects of human actions. Eventually these are manifested as soil erosion, species extinction, deforestation, ugliness, pollution, social decay, injustice, and economic inefficiencies. In contrast, what can be called *ecological design intelligence* is the capacity to understand the ecological context in which humans live, to recognize limits, and to get the scale of things right. It is the ability to calibrate human purposes and natural constraints and do so with grace and economy. Ecological design intelligence is not just about things like technologies; it also has to do with the shape and dimension of our ideas and philosophies relative to the earth. At its heart ecological

design intelligence is motivated by an ethical view of the world and our obligations to it. On occasion it requires the good sense and moral energy to say no to things otherwise possible and, for some, profitable. The surest signs of ecological design intelligence are collective achievements: healthy, durable, resilient, just, and prosperous communities.

I believe that educators must become students of the ecologically proficient mind and of the things that must be done to foster such minds. In time this will mean nothing less than the redesign of education itself.

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PART ONE



THE PROBLEM OF EDUCATION

EDUCATION is not widely regarded as a problem, although the lack of it is. The conventional wisdom holds that all education is good, and the more of it one has, the better. The essays in Part one challenge this view from an ecological perspective. The truth is that without significant precautions, education can equip people merely to be more effective vandals of the earth. If one listens carefully, it may even be possible to hear the Creation groan every year in late May when another batch of smart, degree-holding, but ecologically illiterate, *Homo sapiens* who are eager to succeed are launched into the biosphere. The essays in Part one, accordingly, address the problem *of* education rather than problems *in* education. They are not a call to tinker with minutiae, but a call to deeper change.



What Is Education For?

IF TODAY is a typical day on planet earth, we will lose 116 square miles of rain forest, or about an acre a second. We will lose another 72 square miles to encroaching deserts, the results of human mismanagement and overpopulation. We will lose 40 to 250 species, and no one knows whether the number is 40 or 250. Today the human population will increase by 250,000. And today we will add 2,700 tons of chlorofluorocarbons and 15 million tons of carbon dioxide to the atmosphere. Tonight the earth will be a little hotter, its waters more acidic, and the fabric of life more threadbare. By year's end the numbers are staggering: The total loss of rain forest will equal an area the size of the state of Washington; expanding deserts will equal an area the size of the state of West Virginia; and the global population will have risen by more than 90,000,000. By the year 2000 perhaps as much as 20% of the life forms extant on the planet in the year 1900 will be extinct.

The truth is that many things on which our future health and prosperity depend are in dire jeopardy: climate stability, the resilience and productivity of natural systems, the beauty of the natural world, and biological diversity.

It is worth noting that this is not the work of ignorant people. Rather, it is largely the results of work by people with BAs, BSs, LLBs, MBAs, and PhDs. Elie Wiesel once made the same point, noting that the designers and perpetrators of Auschwitz, Dachau, and Buchenwald—the Holocaust—were the heirs of Kant and Goethe, widely thought to be the best educated people on earth. But their education did not serve as an adequate barrier to barbarity. What was wrong with their education? In Wiesel's (1990) words,

It emphasized theories instead of values, concepts rather than human beings, abstraction rather than consciousness, answers instead of questions, ideology and efficiency rather than conscience.

I believe that the same could be said of our education. Toward the natural world it too emphasizes theories, not values; abstraction rather than consciousness; neat answers instead of questions; and technical efficiency over conscience. It is a matter of no small consequence that the only people who have lived sustainably on the planet for any length of time could not read, or like the Amish do not make a fetish of reading. My point is simply that education is no guarantee of decency, prudence, or wisdom. More of the same kind of education will only compound our problems. This is not an argument for ignorance but rather a statement that the worth of education must now be measured against the standards of decency and human survival—the issues now looming so large before us in the twenty-first century. It is not education, but education of a certain kind, that will save us.

❖ Myth ❖

What went wrong with contemporary culture and education? We can find insight in literature, including Christopher Marlowe's portrayal of Faust who trades his soul for knowledge and power, Mary Shelley's Dr. Frankenstein who refuses to take responsibility for his creation, and Herman Melville's Captain Ahab who says "All my means are sane, my motive and my object mad." In these characters we encounter the essence of the modern drive to dominate nature.

Historically, Francis Bacon's proposed union between knowledge and power foreshadowed the contemporary alliance between government, business, and knowledge that has wrought so much mischief. Galileo's separation of the intellect foreshadowed the dominance of the analytical mind over that part given to creativity, humor, and wholeness. And in Descartes's epistemology, one finds the roots of the radical separation of self and object. Together these three laid the foundations for modern education, foundations that now are enshrined in myths that we have come to accept without question. Let me suggest six.

First, there is the myth that ignorance is a solvable problem. Ignorance is not a solvable problem; it is rather an inescapable part of the human condition. We cannot comprehend the world in its entirety. The

advance of knowledge always carried with it the advance of some form of ignorance. For example, in 1929 the knowledge of what a substance like chlorofluorocarbons (CFCs) would do to the stratospheric ozone and climate stability was a piece of trivial ignorance as the compound had not yet been invented. But in 1930 after Thomas Midgely, Jr., discovered CFCs, what had been a piece of trivial ignorance became a critical life-threatening gap in human understanding of the biosphere. Not until the early 1970s did anyone think to ask "What does this substance do to what?" In 1986 we discovered that CFCs had created a hole in the ozone over the South Pole the size of the lower 48 U.S. states; by the early 1990s, CFCs had created a worldwide reduction of ozone. With the discovery of CFCs, knowledge increased, but like the circumference of an expanding circle, ignorance grew as well.

A second myth is that with enough knowledge and technology, we can, in the words of *Scientific American* (1989), "manage planet earth." Higher education has largely been shaped by the drive to extend human domination to its fullest. In this mission, human intelligence may have taken the wrong road. Nonetheless, managing the planet has a nice ring to it. It appeals to our fascination with digital readouts, computers, buttons, and dials. But the complexity of earth and its life systems can never be safely managed. The ecology of the top inch of topsoil is still largely unknown as is its relationship to the larger systems of the biosphere. What might be managed, however, is us: human desires, economies, politics, and communities. But our attention is caught by those things that avoid the hard choices implied by politics, morality, ethics, and common sense. It makes far better sense to reshape ourselves to fit a finite planet than to attempt to reshape the planet to fit our infinite wants.

A third myth is that knowledge, and by implication human goodness, is increasing. An information explosion, by which I mean a rapid increase of data, words, and paper is taking place. But this explosion should not be mistaken for an increase in knowledge and wisdom, which cannot be measured so easily. What can be said truthfully is that some knowledge is increasing while other kinds of knowledge are being lost. For example, David Ehrenfeld has pointed out that biology departments no longer hire faculty in such areas as systematics, taxonomy, or ornithology (personal communication). In other words, important knowledge is being lost because of the recent overemphasis on molecular biology and genetic engineering, which are more lucrative but not more important areas of

inquiry. Despite all of our advances in some areas, we still do not have anything like the science of land health that Aldo Leopold called for a half-century ago.

It is not just knowledge in certain areas that we are losing but also vernacular knowledge, by which I mean the knowledge that people have of their places. According to Barry Lopez (1989),

it is the chilling nature of modern society to find an ignorance of geography, local or national, as excusable as an ignorance of hand tools; and to find the commitment of people to their home places only momentarily entertaining, and finally naive.

[I am] forced to the realization that something strange, if not dangerous, is afoot. Year by year the number of people with firsthand experience in the land dwindles. Rural populations continue to shift to the cities. . . . In the wake of this loss of personal and local knowledge, the knowledge from which a real geography is derived, the knowledge on which a country must ultimately stand, has come something hard to define but I think sinister and unsettling. (p. 55)

The modern university does not consider this kind of knowledge worth knowing except to record it as an oddity “folk culture.” Instead, it conceives its mission as that of adding to what is called “the fund of human knowledge” through research. What can be said of research? Historian Page Smith (1990) has offered one answer:

The vast majority of so-called research turned out in the modern university is essentially worthless. It does not result in any measurable benefit to anything or anybody. It does not push back those omnipresent ‘frontiers of knowledge’ so confidently evoked; it does not *in the main* result in greater health or happiness among the general populace or any particular segment of it. It is busywork on a vast, almost incomprehensible scale. It is dispiriting; it depresses the whole scholarly enterprise; and most important of all, it deprives the student of what he or she deserves—the thoughtful and considerate attention of a teacher deeply and unequivocally committed to teaching. (p. 7)

In the confusion of data with knowledge is a deeper mistake that learning will make us better people. But learning, as Loren Eiseley (1979) once said, is endless and “in itself . . . will never make us ethical men” (p. 284). Ultimately, it may be the knowledge of the good that is most threatened by all of our other advances. All things considered, it is possible that

we are becoming more ignorant of the things we must know to live well and sustainably on the earth.

In thinking about the kinds of knowledge and the kinds of research that we will need to build a sustainable society, a distinction needs to be made between intelligence and cleverness. True intelligence is long range and aims toward wholeness. Cleverness is mostly short range and tends to break reality into bits and pieces. Cleverness is personified by the functionally rational technician armed with know-how and methods but without a clue about the higher ends technique should serve. The goal of education should be to connect intelligence with an emphasis on whole systems and the long range with cleverness, which involves being smart about details.

A fourth myth of higher education is that we can adequately restore that which we have dismantled. I am referring to the modern curriculum. We have fragmented the world into bits and pieces called disciplines and subdisciplines, hermetically sealed from other such disciplines. As a result, after 12 or 16 or 20 years of education, most students graduate without any broad, integrated sense of the unity of things. The consequences for their personhood and for the planet are large. For example, we routinely produce economists who lack the most rudimentary understanding of ecology or thermodynamics. This explains why our national accounting systems do not subtract the costs of biotic impoverishment, soil erosion, poisons in our air and water, and resource depletion from gross national product. We add the price of the sale of a bushel of wheat to the gross national product while forgetting to subtract the three bushels of topsoil lost to grow it. As a result of incomplete education, we have fooled ourselves into thinking that we are much richer than we are. The same point could be made about other disciplines and subdisciplines that have become hermetically sealed from life itself.

Fifth, there is a myth that the purpose of education is to give students the means for upward mobility and success. Thomas Merton (1985) once identified this as the “mass production of people literally unfit for anything except to take part in an elaborate and completely artificial charade” (p. 11). When asked to write about his own success, Merton responded by saying that “if it so happened that I had once written a best seller, this was a pure accident, due to inattention and naivete, and I would take very good care never to do the same again” (p. 11). His advice to students was to “be anything you like, be madmen, drunks, and bastards of every shape and form, but at all costs avoid one thing: success”

(p. 11). The plain fact is that the planet does not need more successful people. But it does desperately need more peacemakers, healers, restorers, storytellers, and lovers of every kind. It needs people who live well in their places. It needs people of moral courage willing to join the fight to make the world habitable and humane. And these qualities have little to do with success as our culture has defined it.

Finally, there is a myth that our culture represents the pinnacle of human achievement. This, of course, represents cultural arrogance of the worst sort and a gross misreading of history and anthropology. Recently, this view has taken the form that we won the Cold War. Communism failed because it produced too little at too high a cost. But capitalism has also failed because it produces too much, shares too little, also at too high a cost to our children and grandchildren. Communism failed as an ascetic morality. Capitalism has failed because it destroys morality altogether. This is not the happy world that any number of feckless advertisers and politicians describe. We have built a world of sybaritic wealth for a few and Calcuttan poverty for a growing underclass. At its worst, it is a world of crack on the streets, insensate violence, anomie, and the most desperate kind of poverty. The fact is that we live in a disintegrating culture. Ron Miller (1989) stated it this way:

Our culture does not nourish that which is best or noblest in the human spirit. It does not cultivate vision, imagination, or aesthetic or spiritual sensitivity. It does not encourage gentleness, generosity, caring, or compassion. Increasingly in the late twentieth century, the economic-technocratic-statist worldview has become a monstrous destroyer of what is loving and life-affirming in the human soul. (p. 2)

❖ Rethinking Education ❖

Measured against the agenda of human survival, how might we rethink education? Let me suggest six principles.

First, all education is environmental education. By what is included or excluded, students are taught that they are part of or apart from the natural world. To teach economics, for example, without reference to the laws of thermodynamics or ecology is to teach a fundamentally important ecological lesson: that physics and ecology have nothing to do with the economy. It just happens to be dead wrong. The same is true throughout the curriculum.

A second principle comes from the Greek concept of Paideia. The goal of education is not mastery of subject matter but mastery of one's person. Subject matter is simply the tool. Much as one would use a hammer and a chisel to carve a block of marble, one uses ideas and knowledge to forge one's own personhood. For the most part we labor under a confusion of ends and means, thinking that the goal of education is to stuff all kinds of facts, techniques, methods, and information into the student's mind, regardless of how and with what effect it will be used. The Greeks knew better.

Third, I propose that knowledge carries with it the responsibility to see that it is well used in the world. The results of a great deal of contemporary research bear resemblance to those foreshadowed by Mary Shelley: monsters of technology and its byproducts for which no one takes responsibility or is even expected to take responsibility. Whose responsibility is Love Canal? Chernobyl? Ozone depletion? The *Exxon Valdez* oil spill? Each of these tragedies was possible because of knowledge created for which no one was ultimately responsible. This may finally come to be seen for what I think it is: a problem of scale. Knowledge of how to do vast and risky things has far outrun our ability to use it responsibly. Some of this knowledge cannot be used responsibly, safely, and to consistently good purposes.

Fourth, we cannot say that we know something until we understand the effects of this knowledge on real people and their communities. I grew up near Youngstown, Ohio, which was largely destroyed by corporate decisions to "disinvest" in the economy of the region. In this case MBA graduates, educated in the tools of leveraged buyouts, tax breaks, and capital mobility, have done what no invading army could do: They destroyed an American city with total impunity and did so on behalf of an ideology called the "bottom line." But the bottom line for society includes other costs: those of unemployment, crime, higher divorce rates, alcoholism, child abuse, lost savings, and wrecked lives. In this instance what was taught in the business schools and economics departments did not include the value of good communities or the human costs of a narrow destructive economic rationality that valued efficiency and economic abstractions above people and community (Lynd, 1982).

My fifth principle follows and is drawn from William Blake. It has to do with the importance of "minute particulars" and the power of examples over words. Students hear about global responsibility while being educated in institutions that often spend their budgets and invest their

endowments in the most irresponsible things. The lessons being taught are those of hypocrisy and ultimately despair. Students learn, without anyone ever telling them, that they are helpless to overcome the frightening gap between ideals and reality. What is desperately needed are (a) faculty and administrators who provide role models of integrity, care, and thoughtfulness and (b) institutions capable of embodying ideals wholly and completely in all of their operations.

Finally, I propose that the way in which learning occurs is as important as the content of particular courses. Process is important for learning. Courses taught as lecture courses tend to induce passivity. Indoor classes create the illusion that learning only occurs inside four walls, isolated from what students call, without apparent irony, the "real world." Dissecting frogs in biology classes teaches lessons about nature that no one in polite company would verbally profess. Campus architecture is crystallized pedagogy that often reinforces passivity, monologue, domination, and artificiality. My point is simply that students are being taught in various and subtle ways beyond the overt content of courses.

❖ Reconstruction ❖

What can be done? Lots of things, beginning with the goal that no student should graduate from any educational institution without a basic comprehension of things like the following:

- the laws of thermodynamics,
- the basic principles of ecology,
- carrying capacity,
- energetics,
- least-cost, end-use analysis,
- limits of technology,
- appropriate scale,
- sustainable agriculture and forestry,
- steady-state economics, and
- environmental ethics.

I would add to this list of analytical and academic things, practical things necessary to the art of living well in a place: growing food; building shelter; using solar energy; and a knowledge of local soils, flora, fauna, and the local watershed. Collectively, these are the foundation for the capacity to distinguish between health and disease, development and growth, suf-

ficient and efficient, optimum and maximum, and "should do" from "can do."

In Aldo Leopold's words, does the graduate know that "he is only a cog in an ecological mechanism? That if he will work with that mechanism his mental wealth and his material wealth can expand indefinitely? But that if he refuses to work with it, it will ultimately grind him to dust"? And Leopold asked, "If education does not teach us these things, then what is education for?" (p. 210).

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CHAPTER TWO

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The Dangers of Education

WE ARE currently preparing to launch yet another of our periodic national crusades to improve education. I am in favor of improving education, but what does it mean to improve education and what great ends will that improved education serve? The answer now offered from high places is that we must equip our youths to compete in the world economy. The great fear is that we will not be able to produce as many automobiles, VCRs, digital TVs, or supercomputers as the Japanese or Europeans. In contrast, I worry that we *will* compete all too effectively on an earth already seriously overstressed by the production of things economists count and too little production of things that are not easily countable such as well-loved children, good cities, healthy forests, stable climate, healthy rural communities, sustainable family farms, and diversity of all sorts. Many of the educational reforms now being proposed have little to do with the goals of personal wholeness, or the pursuit of truth and understanding, and even less to do with the great issues of how we might live within the limits of the earth. The reformers aim to produce people whose purposes and outlook are narrowly economic, not to educate citizens and certainly not “citizens of the biotic community.”

The important facts of our time have more to do with too much economic activity of the wrong kind than they have to do with too little. Our means of livelihood are implicated everywhere in the sharp decline of the vital signs of the earth. Because of our fossil fuel-based economies and transportation systems, we are now conducting a risky and irreversible experiment with global climate. The same systems have badly damaged the ozone layer. The way we produce food and fiber is responsible for the loss of 24 billion tons of soil each year, the sharp decline in biological

diversity, and the spread of deserts worldwide. The blind pursuit of national security has left a legacy of debt, toxicity, and radioactivity that will threaten the health and well-being of those purportedly defended for a long time to come. In addition, we continue to issue forth a stream of technologies and systems of technology that do not fit the ecological dimensions of the earth.

Most of this was not done by the unschooled. Rather it is the work of people who, in Gary Snyder’s (1990) words,

make unimaginably large sums of money, people impeccably groomed, excellently educated at the best universities—male and female alike—eating fine foods and reading classy literature, while orchestrating the investment and legislation that ruin the world. (p. 119)

Education, in other words, can be a dangerous thing. Accordingly, I intend to focus on the problem *of* education, not problems *in* education. It is time, I believe, for an educational “perestroika,” by which I mean a general rethinking of the process and substance of education at all levels, beginning with the admission that much of what has gone wrong with the world is the result of education that alienates us from life in the name of human domination, fragments instead of unifies, overemphasizes success and careers, separates feeling from intellect and the practical from the theoretical, and unleashes on the world minds ignorant of their own ignorance. As a result, an increasing percentage of the human intelligence must attempt to undo a large part of what mere intellectual cleverness has done carelessly and greedily.

❖ Anticipations ❖

Most ancient civilizations knew what we have apparently forgotten: that knowledge is a fearful thing. To know the name of something was to hold power over it. Misused, that power would break the sacred order and wreak havoc. Ancient myths and legends are full of tales of people who believed that they were smarter than the gods and immune from divine punishment. But in whatever form, eating from the tree of knowledge meant banishment from one garden or another. In the modern world this Janus-like quality of knowledge has been forgotten. Descartes, for example, reached the conclusion that “the more I sought to inform myself, the more I realized how ignorant I was.” Instead of taking this as a proper

conclusion of a good education, Descartes set about to find certain truths through a process of radical skepticism. Francis Bacon went even further, to propose an alliance between science and power, which reached fruition in the Manhattan Project and the first atomic bomb.

There were warnings, however. Displaced tribal peoples commonly regarded Europeans as crazy. In 1744, for example, the Chiefs of the Six Nations declined an offer to send their sons to the College of William and Mary in these words:

Several of our young people were formerly brought up at the colleges of the northern provinces: they were instructed in your sciences; but when they came back to us, they were bad runners, ignorant of every means of living in the woods . . . neither fit [to be] hunters, warriors, nor counsellors, they were totally good for nothing. (McLuhan, 1971, p. 57)

Native Americans detected the lack of connectedness and rootedness that Europeans, with all of their advancements, could not see in themselves. European education incapacitated whites in ways visible only through the eyes of people whose minds still participated in the creation and for whom the created order was still enchanted. In other words, European minds were not prepared for the encounter with wilderness nor were they prepared to understand those who could live in it. One had to step out of the dominant Eurocentrism and see things from the outside looking in. A century later Ralph Waldo Emerson was moving toward a similar conclusion:

We are shut up in schools and college recitation rooms for ten or fifteen years, and come out at least with a bellyful of words and do not know a thing. We cannot use our hands, or our legs, or our eyes or our arms. We do not know an edible root in the woods. We cannot tell our course by the stars, nor the hour of the day by the sun. (p. 136)

These and other warnings were forebodings of a much more serious problem that would gain momentum in the century to come. I think this becomes clearer in a comparison of two prominent but contrary figures of the middle years of the twentieth century.

One, Albert Speer, was born in Germany in 1905 to a well-to-do upper-middle-class family. His father was one of the busiest architects in the booming industrial city of Mannheim. Speer attended a distinguished private school and later various institutes of technology in Karlsruhe,

Munich, and Berlin. At the age of 23, Speer became a licensed architect. He is not known to us for his architecture, however, but for his organizational genius as Hitler's Minister of Armaments. In that role he kept World War II going far longer than it otherwise would have by keeping German arms production rising under the onslaught of Allied bombing until the final months. For his part in extending the war and for using slave labor to do so, Speer was condemned by the Nuremberg Tribunal to serve 20 years at Spandau Prison.

I think Speer's teachers and professors should share some of the blame. For example, in his memoirs Speer (1970) described his education as apolitical:

[Our education] impressed upon us that the distribution of power in society and the traditional authorities were part of the God-given order of things. . . . It never occurred to us to doubt the order of things. (p. 8)

The result was a "generation without defenses" for the seductions of Hitler and the new technologies of political persuasion. The best educated nation in Europe had no civic education when it most needed it. Speer was not appreciably different from millions of others swept along by the current of Nazism.

The purge of June 30, 1934, was a moral turning point after which Speer silenced all doubts about his role in the Nazi hierarchy:

I saw a large pool of dried blood on the floor. There on June 30 Herbert Von Bose, one of Papen's assistants, had been shot. I looked away and from then on avoided the room. But the incident did not affect me more deeply than that. (p. 53)

Speer had found his Mephistopheles:

After years of frustrated efforts I was wild to accomplish things—and twenty-eight years old. For the commission to do a great building, I would have sold my soul like Faust. Now I had found my Mephistopheles. He seemed no less engaging than Goethe's. (p. 31)

In looking back over his life near its end, Speer made the following comment:

My moral failure is not a matter of this item and that; it resides in my active association with the whole course of events. I had participated in a war which, as we of the intimate circle should never have

doubted, was aimed at world dominion. What is more, by my abilities and my energies I had prolonged that war by many months. . . . Dazzled by the possibilities of technology, I devoted crucial years of my life to serving it. But in the end my feelings about it are highly skeptical. (pp. 523–524)

Finally, in what certainly would be among the most plaintive lines penned by any leading figure of the twentieth century, Speer wrote, “The tears I shed are for myself as well as for my victims, for the man I could have been but was not, for a conscience I so easily destroyed.”

If Speer and the years between 1933 and 1945 seem remote from the issues of the late twentieth century, one has only to change the names to see a relationship. Instead of World War II, think of the war being waged against nature. Instead of the Holocaust think of the biological holocaust now under way in which perhaps 20% of the life forms on the planet in the year 1900 will have disappeared by the early years of the next century. Instead of the fanaticism of the 1000-year Reich, think of the fanaticism inherent in the belief that economies have no limits and can grow forever. Speer’s upbringing and formal education provided neither the wherewithal to think about the big issues of his time nor the good sense to call these by their right names. I do not think for a moment that this kind of education ended in 1945. It remains the predominant mode of education almost everywhere in an age that still regards economic growth as the highest goal.

Like Speer, Aldo Leopold was middle-class, the son of a prosperous furniture manufacturer (in Burlington, Iowa) and had all the advantages of good upbringing (Meine, 1988). Leopold’s lifelong study of nature began as a boy in the nearby marshes along the Mississippi River. His formal education at Lawrence Academy in New Jersey and at Yale University were, I think, rather incidental to his self-education, which consisted of long walks over the nearby countryside. Leopold was an outdoorsman who, over a lifetime of rambling, developed the ability to observe in nature what others could not see. He was a keen student of nature, and it was this capacity that makes Leopold interesting and important to us. Leopold grew from a rather conventional resource manager employed by the U.S. Forest Service to become a scientist and philosopher who asked questions about the proper human role in nature that no one else bothered to ask. This progression led him to discard the idea of human dominance and to propose more radical ideas on the basis of our citizenship in the natural order.

Where Speer had seen human blood on the floor and turned away, Leopold described a different kind of turning point that took place on a rimrock overlooking a river in the Gila Wilderness in 1922. Leopold and his companions spotted a she-wolf and cubs along the bank and opened fire:

We reached the old wolf in time to watch a fierce green fire dying in her eyes. I realized then, and have known ever since, that there was something new to me in those eyes—something known only to her and to the mountain. I was young then and full of trigger itch; I thought that because fewer wolves meant more deer, then no wolves would mean a hunters’ paradise. But after seeing the green fire die, I sensed that neither the wolf nor the mountain agreed with such a view. (Leopold, 1966, pp. 137–139)

The rest of Leopold’s life was an extended meditation on that fierce green fire, how mountains think, and what both meant for humans.

Where Speer regarded himself as apolitical, Leopold (1966) regarded “biological education as a means of building citizens” (p. 208). Instead of possessing a deep naivete about science, Leopold (1991) was scientific about science as few have ever been:

We are not scientists. We disqualify ourselves at the outset by professing loyalty to and affection for a thing: wildlife. A scientist in the old sense may have no loyalties except to abstractions, no affections except for his own kind. . . . The definitions of science written by, let us say, the National Academy, deal almost exclusively with the creation and exercise of power. But what about the creation and the exercise of wonder or respect for workmanship in nature? (p. 276)

Where Speer’s (1970) approach to nature was sentimental and escapist (to escape “the demands of a world growing increasingly complicated”), Leopold’s (1966) was hardheaded and practical:

The cultural value of wilderness boils down in the last analysis, to a question of intellectual humility. The shallow minded modern who has lost his rootage in the land assumes that he has already discovered what is important; it is such who prate of empires, political or economic, that will last a thousand years. (p. 279)

Where Speer had to learn his ethics in 20 years of confinement after the damage was done, Leopold learned his over a lifetime and laid the basis for an ecologically solvent land ethic. And where Speer’s education made

him immune to seeing or feeling tragedy unfolding around him, Leopold (1966) wrote the following:

One of the penalties of an ecological education is that one lives alone in a world of wounds. Much of the damage inflicted on land is quite invisible to laymen. An ecologist must either harden his shell and make believe that the consequences of science are none of his business, or he must be the doctor who sees the marks of death in a community that believes itself to be well and does not want to be told otherwise. (p. 197)

After Speer and the Nazis, it has taken decades to undo the damage that could be undone. After Aldo Leopold, in contrast, it will take decades to fully grasp what he meant by a “land ethic” and considerably longer to make it a reality.

❖ Dangers ❖

From the lives of Speer and Leopold, what can be said about the dangers of formal education or schooling? This first and overriding danger is that it will encourage young people to find careers before they find a decent calling. A career is a job, a way to earn one’s keep, a way to build a long resume, a ticket to somewhere else. For upwardly mobile professionals, a career is too often a way to support a “lifestyle” by which one takes more than one gives back. In contrast, a calling has to do with one’s larger purpose, personhood, deepest values, and the gift one wishes to give the world. A calling is about the use one makes of a career. A career is about specific aptitudes; a calling is about purpose. A career is planned with the help of “career development” specialists. A calling comes out of an inner conversation. A career can always be found in a calling, but a calling cannot easily be found in a career. The difference is roughly like deciding to which end of the cart to attach the horse. Speer’s problem was not a deficiency of mathematical skills, or reading ability, or computing ability, or logic narrowly conceived. I imagine that he would have done well on the Scholastic Aptitude Test or the Graduate Record Exam. His problem was simply that he had no calling that could bridle and channel his ambition. He simply wanted to “succeed,” doing whatever it took. He was, as he said, “wild to accomplish,” and ambition disconnected the alarm bells that should have sounded long before he saw blood on the floor in 1934. Speer was a careerist with no calling.

Leopold, on the other hand, found his calling as a boy in the marshes around Burlington, Iowa, and followed it wherever it took him. In time it took him a long way. From his boyhood interest in birds, he went on in adult life to initiate the field of game management, to organize the Wilderness Society, to work actively on behalf of conservation throughout his lifetime, and to lay the groundwork for the field of environmental ethics, while still finding time to be a good teacher and a good father. There is a consistency and harmony to Leopold’s life rather like a pilgrim following a vision.

A second danger of formal schooling is that it will imprint a disciplinary template onto impressionable minds and with it the belief that the world really is as disconnected as the divisions, disciplines, and subdisciplines of the typical curriculum. Students come to believe that there is such a thing as politics separate from ecology or that economics has nothing to do with physics. Yet, the world is not this way, and except for the temporary convenience of analysis, it cannot be broken into disciplines and specializations without doing serious harm to the world and to the minds and lives of people who believe that it can be. We often forget to tell students that the convenience was temporary, and more seriously, we fail to show how things can be made whole again. One result is that students graduate without knowing how to think in whole systems, how to find connections, how to ask big questions, and how to separate the trivial from the important. Now more than ever, however, we need people who think broadly and who understand systems, connections, patterns, and root causes.

This is an unlikely outcome of education conceived as the propagation of technical intelligence alone. Speer in his Nazi years was a technician and a good one. His formal schooling gave him the tools that could be used by the Third Reich but not the sense to ask why and not the humanity necessary to recognize the face of barbarity when he saw it. Leopold, in contrast, began his career as something of a technician, but outgrew it. *A Sand County Almanac*, written shortly before his death, was a nearly perfect blend of science, natural history, and philosophy.

Third, there is the danger that education will damage the sense of wonder—the sheer joy in the created world—that is part of our original equipment at birth. It does this in various ways: by reducing learning to routines and memorization, by excess abstractions divorced from lived experience, by boring curriculum, by humiliation, by too many rules, by overstressing grades, by too much television and too many computers, by

too much indoor learning, and mostly by deadening the feelings from which wonder grows. As our sense of wonder in nature diminishes, so too does our sense of the sacred, our pleasure in the created world, and the impulse behind a great deal of our best thinking. Where it is kept intact and growing, teachers need not worry about whether students learn reading, writing, and arithmetic.

In a small book titled *The Sense of Wonder*, Rachel Carson (1984) wrote that "it is not half so important to *know* as to *feel*" (p. 45). Feelings, she wrote, begin early in life in the exploration of nature, generally with the companionship of an adult. The sense of wonder is rooted in the trust that the world is, on balance, a friendly place full of interesting life "beyond the boundaries of human existence" (p. 88). The sense of wonder that Carson describes is not equivalent to a good science education, although in principle I see no reason why the two cannot be made compatible. I do not believe that wonder can be taught as "Wonder 101." If Carson is right, it can only be felt, and those early feelings must be encouraged, supported, and legitimized by a caring and knowledgeable adult. My hunch is that the sense of wonder is fragile; once crushed, it rarely blossoms again but is replaced by varying shades of cynicism and disappointment in the world.

I know of no measures for wonder, but I think Speer lost his early on. His relation to nature prior to 1933 was, by his testimony, romantic and escapist. Thereafter, he mentioned it no more. To Speer, the adult, the natural world was not particularly wondrous, nor was it a source of insight, pleasure, or perspective. His orientation toward life, like that of the Nazi hierarchy, was necrophilic. Leopold, on the contrary, was a life-long student of nature in the wild. By all accounts he was a remarkably astute observer of land, which explains a great deal of his utter sanity and clarity of mind. Leopold's intellectual and spiritual anchor was not forged in a laboratory or a library but in time spent in the wild and in his later years in a rundown farm he purchased that the family called "the shack."

❖ Conclusion ❖

What are the dangers of education? There are three that are particularly consequential for the way we live on the earth: (1) that formal education will cause students to worry about how to make a living before they know who they are, (2) that it will render students narrow technicians who are morally sterile, and (3) that it will deaden their sense of wonder for the

created world. Of course education cannot do these things alone. It requires indifferent or absentee parents, shopping malls, television-MTV-Nintendo, a culture aimed at the lowest common denominator, and de-placed people who do not know the very ground beneath their feet. Schooling is only an accomplice in a larger process of cultural decline. Yet, no other institution is better able to reverse that decline. The answer, then, is not to abolish or diminish formal education but rather to change it.

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CHAPTER THREE



The Problem of Education

AFTER due reflection on the state of education in his time, H. L. Mencken concluded that significant improvement required only that the schools be burned to the ground and all of the professorate be hanged. For better or worse, the suggestion was ignored. Made today, however, it might find a more receptive public ready to purchase the gasoline and rope. Americans, united on little else, seem of one mind in believing that, K through PhD, the educational system is too expensive, too cumbersome, and not, on the whole, very effective. It needs, they believe, radical reform. They are, however, divided on how to go about it.

Both sides of the debate, nonetheless, agree on the basic aims and purposes of education, which are to equip our nation with a “world-class” labor force, first, to compete more favorably in the global economy and, second, to provide each individual with the means for maximum upward mobility. On these, the purposes of education both higher and lower, there is great repose.

There are, nonetheless, better reasons to rethink education that have to do with the issues of human survival, which will dominate the world of the twenty-first century. Those now being educated will have to do what we, the present generation, have been unable or unwilling to do: stabilize world population; stabilize and then reduce the emission of greenhouse gases, which threaten to change the climate, perhaps disastrously; protect biological diversity; reverse the destruction of forests everywhere; and conserve soils. They must learn how to use energy and materials with great efficiency. They must learn how to utilize solar energy in all of its forms. They must rebuild the economy in order to eliminate waste and pollution. They must learn how to manage renewable resources for the long run. They must begin the great work of repairing,

as much as possible, the damage done to the earth in the past 200 years of industrialization. And they must do all of this while they reduce worsening social and racial inequities. No generation has ever faced a more daunting agenda.

For the most part, however, we are still educating the young as if there were no planetary emergency. Remove computers and a scattering of courses and programs throughout the catalog, and the curriculum of the 1990s looks a lot like that of the 1950s. The crisis we face is first and foremost one of mind, perception, and values; hence, it is a challenge to those institutions presuming to shape minds, perceptions, and values. It is an educational challenge. More of the same kind of education can only make things worse. This is not an argument against education but rather an argument for the kind of education that prepares people for lives and livelihoods suited to a planet with a biosphere that operates by the laws of ecology and thermodynamics.

The skills, aptitudes, and attitudes necessary to industrialize the earth, however, are not necessarily the same as those that will be needed to heal the earth or to build durable economies and good communities. Resolution of the great ecological challenges of the next century will require us to reconsider the substance, process, and purpose of education at all levels and to do so, in the words of Yale University historian Jaroslav Pelikan (1992), “with an intensity and ingenuity matching that shown by previous generations in obeying the command to have dominion over the planet (p. 21). But Pelikan (1992) himself doubts whether the university “has the capacity to meet a crisis that is not only ecological and technological, but ultimately educational and moral” (pp. 21–22). Why should this be so? Why should those institutions charged with the task of preparing the young for the challenges of life be so slow to recognize and act on the major challenges of the coming century?

A clue can be found in a recent book by Derek Bok (1990), a former president of Harvard University, who wrote,

Our universities excel in pursuing the easier opportunities where established academic and social priorities coincide. On the other hand, when social needs are not clearly recognized and backed by adequate financial support, higher education has often failed to respond as effectively as it might, even to some of the most important challenges facing America. Armed with the security of tenure and the time to study the world with care, professors would appear to have a unique opportunity to act as society’s scouts to signal impending problems. . . . Yet rarely have members of the academy succeeded in

discovering emerging issues and bringing them vividly to the attention of the public. What Rachel Carson did for risks to the environment, Ralph Nader for consumer protection, Michael Harrington for problems of poverty, Betty Friedan for women's rights, they did as independent critics, not as members of a faculty. (p. 105)

This observation, appearing on page 105 of Bok's book, is not mentioned thereafter. It should have been on page 1 and would have provided the subject for a better book. Had Bok gone further, he might have been led to ask whether the same charge of lethargy might be made against those presuming to lead American education. Bok might then have been led to rethink old and unquestioned assumptions about liberal education. For example, John Henry Newman (1982), in his classic *The Idea of a University*, drew a distinction between practical and liberal learning that has influenced education from his time to our own. Liberal knowledge, according to Newman, "refuses to be informed by any end, or absorbed into any art" (p. 81); knowledge is liberal if "nothing accrues of consequence beyond the using" (p. 82). Furthermore, Newman stated that "liberal education and liberal pursuits are exercises of mind, of reason, of reflection" (p. 80). All else he regarded as practical learning, which Newman believed has no place in the liberal arts. To this day, Newman's distinction between practical and liberal knowledge is seldom transgressed in liberal arts institutions. Is it any wonder that faculty, mindful of the penalties for transgressions of one sort or another, do not often deal boldly with the kinds of issues that Bok describes? I do not wish to take faculty off the hook, but I would like to note that educational institutions, more often than not, reward indoor thinking, careerism, and safe conformity to prevailing standards. Educational institutions are not widely known for encouraging boat rockers, and I seriously doubt that Bok's own institution would have awarded tenure to Rachel Carson, Ralph Nader, or Michael Harrington.

Harvard philosopher and mathematician Alfred North Whitehead had a different view of the liberal arts. "The mediocrity of the learned world," he wrote in 1929, could be traced to its "exclusive association of learning with book-learning" (Whitehead 1967, p. 51). Whitehead went on to say that real education requires "first-hand knowledge," by which he meant an intimate connection between the mind and "material creative activity." Others, such as John Dewey and J. Glenn Gray, reached similar conclusions. "Liberal education," Gray (1984) wrote, "is least dependent on formal instruction. It can be pursued in the kitchen, the workshop, on

the ranch or farm . . . where we learn wholeness in response to others" (p. 81). A genuinely liberal education, in other words, ought to be liberally conducted, aiming to develop the full range of human capacities. And institutions dedicated to the liberal arts ought to be more than simply agglomerations of specializations.

Had Bok proceeded further he would have had to address the loss of moral vision throughout education at all levels. In ecologist Stan Rowe's (1990) words the university has

shaped itself to an industrial ideal—the knowledge factory. Now it is overloaded and top-heavy with expertness and information. It has become a know-how institution when it ought to be a know-why institution. Its goal should be deliverance from the crushing weight of unevaluated facts, from bare-bones cognition or ignorant knowledge: knowing in fragments, knowing without direction, knowing without commitment. (p. 129)

Many years ago William James (1987) saw this coming and feared that the university might one day develop into a "tyrannical Machine with unforeseen powers of exclusion and corruption" (p. 113). We are moving along that road and should ask why this has come about and what can be done to reverse course.

One source of the corruption is the marriage between the academy and the worlds of power and commerce. It was a marriage first proposed by Francis Bacon, but not fully consummated until the later years of the twentieth century. But marriage, implying affection and mutual consent, is perhaps not an accurate metaphor. This is instead a cash relationship, which began with a defense contract here and a research project there. At present more than a few university departments still work as adjuncts of the Pentagon and even more as adjuncts of industry in the hope of reaping billions of dollars in fields such as genetic engineering, nanotechnologies, agribusiness, and computer science. Even where this is not true, it is difficult to escape the conclusion that much of what passes for research, as historian Page Smith (1990) wrote, is "essentially worthless . . . busy-work on a vast almost incomprehensible scale" (p. 7).

Behind the glossy facade of the modern academy there is often a vacuum of purpose waiting to be filled by whomever and whatever. For example, the College of Agriculture at a nearby land-grant university of note claims to be helping "position farmers for the future." But when asked what farming would be like in the twenty-first century, the Dean of

the College replied by saying, "I don't know." When asked, "How can you [then] position yourself for it?" the Dean replied, "We have to try as best we can to plan ahead" (Logsdon, 1994, p. 74). This reminds me of the old joke in which the airline pilot reports to the passengers that he has good news and bad news. The good news is that the flight is ahead of schedule. The bad news? "We're lost." And in a time of eroding soils and declining rural communities, "turf grass management" is the hot new item at the college of agriculture.

Finally, had Bok so chosen, he would have been led to question how we define intelligence and what that might imply for our larger prospects. At the heart of our pedagogy and curriculum is a fateful confusion of cleverness with intelligence. Cleverness, as I understand it, tends to fragment things and to focus on the short run. The epitome of cleverness is the specialist whose intellect and person have been shaped by the demands of a single function, what Nietzsche once called an "inverted cripple." Ecological intelligence, on the other hand, requires a broader view of the world and a long-term perspective. Cleverness can be adequately computed by the Scholastic Aptitude Test and the Graduate Record Exam, but intelligence is not so easily measured. In time I think we will come to see that true intelligence tends to be integrative and often works slowly while one is mulling things over.

The modern fetish with smartness is no accident. The highly specialized, narrowly focused intellect fits the demands of instrumental rationality built into the industrial economy, and for reasons described by Brooks Adams (cited in Smith, 1984) 80 years ago,

capital has preferred the specialized mind and that not of the highest quality, since it has found it profitable to set quantity before quality to the limit the market will endure. Capitalists have never insisted upon raising an educational standard save in science and mechanics, and the relative overstimulation of the scientific mind has now become an actual menace to order. (p. 116)

The demands of building good communities within a sustainable society in a just world order will require more than the specialized, one-dimensional mind and more than instrumental cleverness.

❖ The Task ❖

Looking ahead to the twenty-first century, I see the task of educating minds capable of building a sustainable world order as requiring more

comprehensive and ecologically solvent standards for truth. The architects of the modern worldview, notably Galileo and Descartes, assumed that those things that could be weighed, measured, and counted were more true than those that could not be quantified. If it could not be counted, in other words, it did not count. Cartesian philosophy was full of potential ecological mischief, a potential that has become reality. Descartes's philosophy separated man from nature, stripped all intrinsic value from nature, and then proceeded to divide mind and body. Descartes was, at heart, an engineer, and his legacy to the environment of our time is the cold passion to remake the world as if we were merely remodeling a machine. Feelings and intuition were tossed out, as were those fuzzy, qualitative parts of reality, such as aesthetic appreciation, loyalty, friendship, sentiment, empathy, and charity. Descartes's assumptions were neither as simple nor as inconsequential as they might have appeared in his lifetime (1596–1650).

If saving species and environments is our aim, we will need a broader conception of science and a more inclusive rationality that joins empirical knowledge with the same emotions that make us love and sometimes fight. Philosopher Karl Polanyi (1958) described this as "personal knowledge," by which he meant knowledge that calls forth a wider range of human perceptions, feelings, and intellectual powers than those presumed to be narrowly "objective." Personal knowledge, according to Polanyi,

is not made but discovered. . . . It commits us, passionately and far beyond our comprehension, to a vision of reality. Of this responsibility we cannot divest ourselves by setting up objective criteria of verifiability—or falsifiability, or testability. . . . For we live in it as in the garment of our own skin. Like love, to which it is akin, this commitment is a 'shirt of flame', blazing with passion and, also like love, consumed by devotion to a universal demand. Such is the true sense of objectivity in science . . . (p. 64)

Cartesian science rejects passion and personality but ironically can escape neither. Passion and personality are embedded in all knowledge, including the most ascetic scientific knowledge driven by the passion for objectivity. Descartes and his heirs simply had it wrong. There is no way to separate feeling from knowledge. There is no way to separate object from subject. There is no good way and no good reason to separate mind or body from its ecological and emotional context. And some persons, with good evidence, are coming to suspect that intelligence is not a

human monopoly at all (Griffin, 1992). Science without passion and love can give us no reason to appreciate the sunset, nor can it give us any purely objective reason to value life. These must come from deeper sources.

Second, we will have to challenge the hubris buried in the hidden curriculum that says that human domination of nature is good; that the growth of economy is natural; that all knowledge, regardless of its consequences, is equally valuable; and that material progress is our right. As a result we suffer a kind of cultural immune deficiency anemia that renders us unable to resist the seductions of technology, convenience, and short-term gain. In this perspective, the ecological crisis is a test of our loyalties and of our deeper affinities for life: what Harvard biologist Edward O. Wilson (1984) calls "biophilia."

Third, the modern curriculum teaches little about citizenship and responsibilities and a great deal about individualism and rights. The ecological emergency, however, can be resolved only if enough people come to hold a bigger idea of what it means to be a citizen. This will have to be carefully taught at all levels of education, but a pervasive cynicism about our higher potentials and collective abilities now works against us. Even my most idealistic students often confuse self-interest with selfishness, a view that describes both Mother Teresa and Donald Trump as self-maximizers, each merely doing "her thing" or "his thing." This is not just a social and political problem. The ecological emergency is about the failure to comprehend our citizenship in the biotic community. From the modern perspective we cannot see clearly how utterly dependent we are on the "services of nature" and on the wider community of life. Our political language gives little hint of this dependence. As it is now used, the word *patriotism*, for example, is devoid of ecological content. However, it must come to include the use one makes of land, forests, air, water, and wildlife. To abuse natural resources, to erode soils, to destroy natural diversity, to waste, to take more than one's fair share, to fail to replenish what has been used must someday come to be regarded as unpatriotic and wrong. And "politics" once again must come to mean, in Vaclav Havel's (1992) words, "serving the community and serving those who will come after us" (p. 6).

Fourth, there is a widespread, and mostly unquestioned, assumption that our future is one of constantly evolving technology and that this is always and everywhere a good thing. Those who question this faith are dismissed as Luddites by people who, as far as I can tell, know little or nothing about the real history of Luddism. Faith in technology is built into nearly every part of the curriculum as a kind of blind acceptance of

the notion of progress. When pressed, however, true believers describe progress to mean not human, political, or cultural improvement but a mindless, uncontrollable technological juggernaut, erasing ecologies and cultures as it moves through history. Technological fundamentalism, like all fundamentalisms, deserves to be challenged. Is technological change taking us where we want to go? What effect does it have on our imagination and particularly on our social, political, and moral imagination? What net effect does it have on our ecological prospects?

George Orwell (1958) once warned that the "logical end" of technological progress "is to reduce the human being to something resembling a brain in a bottle" (p. 201). Behold, 50 years later, there are now those who propose to develop the necessary technology to "download" the contents of the brain into a machine/body (Moravic, 1988). Orwell's nightmare is coming true and in no small part because of research conducted in our most prestigious universities. Such research stands in sharp contrast to our real needs. We need decent communities, good work to do, loving relationships, stable families, the knowledge necessary to restore what we have damaged, and ways to transcend our inherent self-centeredness. Our needs, in short, are those of the spirit; yet, our imagination and creativity are overwhelmingly aimed at things that as often as not degrade spirit and nature.

❖ Conclusion ❖

Ecological education, in Leopold's (1966) words, is directed toward changing our "intellectual emphasis, loyalties, affections, and convictions" (p. 246). It requires breaking free of old pedagogical assumptions, of the straitjacket of discipline-centric curriculum, and even of confinement in classrooms and school buildings. Ecological education means changing (a) the substance and process of education contained in curriculum, (b) how educational institutions work, (c) the architecture within which education occurs, and most important, (d) the purposes of learning.

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 ❖

The Business of Education

AMERICANS presently seem not to agree very much. However, they do appear to agree that public schools are failing badly. On one side of the debate are those, mostly professional educators, who believe that the problem stems from inadequate funds to pay for higher teachers' salaries, better curricula, updated laboratories, newer buildings, and well-stocked libraries. Others have arrived at a different view—a variation on the theme that government is the problem, not the solution. They believe that the public cannot solve its problems publicly. At the extreme, they may believe that a public does not exist at all, only consumers. In this view social problems, like the problems of poor education, cannot be solved except through the profit motive, private ownership, and the magic of free enterprise. Having helped in no small way to starve and demoralize the public sector, this theory is no longer implausible. Acolytes of this view propose more business–education partnerships, more private schools, and a lot more technology. Plato or Thomas Jefferson would scarcely have recognized the reasons being given for educational reforms, which mostly aim to make our young scholars a “world-class work force” in order to make our economy more competitive in international markets. It is American brand names that we want on the next generation of land-filled consumer trash and junk, not those of other countries.

To this end, corporate and business interests have set about to remake education. Something called the New American Schools Development Corporation, created at former President Bush's request and reportedly run by executives on loan from American Telephone and Telegraph, General Motors, Xerox, and other corporate enterprises, is attempting to