

Chapter Twelve

The Cost Principle

Introduction

The cost principle, as originally stated by individualist anarchists, was "cost the limit of price."

The individualists largely neglected the corollary form of this principle: "cost the basis of price."¹ This neglect was more understandable in the nineteenth century, although even then subsidies played an essential role in the development of capitalism. The much greater significance of government subsidies in today's economy, relative to the total operating costs of big business, makes the corollary impossible to ignore. The corollary form of the cost principle will be our primary focus in this chapter: all costs should be internalized in market price, so that the consumers of goods and services bear the full cost of supplying them.

The cost principle, as stated by Proudhon, Josiah Warren and Stephen Pearl Andrews, was originally understood to require some special administrative mechanism or set of bylaws to enforce, like labor-notes and other forms of voluntary currency, or Warren's time store. Warren set the value principle (setting price by what the market would bear) in opposition to the cost principle. Stephen Pearl Andrews, in his explication of Warren's thought, actually considered market competition to be a form of war by which the strong subjugated the weak, and the rich were made richer and the poor poorer; worse yet, he argued that competition "*prevent[ed] the possibility of a scientific Adjustment of Supply to Demand,*" rather than being the means by which this was done.²

It was the insight of Hodgskin in England, and of Greene and Tucker in America, that no such artificial mechanism was necessary. Rather, the *natural tendency* of the competitive market was for the price of reproducible goods to move toward the cost of production. It was (as we saw in the last chapter) consistent *deviation* from the cost principle that required an artificial mechanism: namely artificial scarcity and unequal exchange resulting from the state's suppression of competition. Despite Warren and Andrews, the problem was not "value" as such, but rather impediments to the natural process by which competition moves value toward cost.

¹ Stephen Pearl Andrews came very close to stating the corollary principle in *The Science of Society*: "The truest condition of society... is that in which each individual is enabled and constrained to assume, to the greatest extent possible, the Cost or disagreeable consequences of his own acts." II:3. And elsewhere: "It is Equity that *every individual should sustain just as much of the common burden of life as has to be sustained BY ANY BODY on his account.*" II:60.

² *Science of Society*, II:147-150; *Ibid.* II:153.

Indeed, as Marx had recognized long before, the deviation of price from cost was the *mechanism* by which the market constantly adjusted supply to demand, and the market gravitated toward an equilibrium point at which the quantities supplied and demanded at a market-clearing price based on cost of production. A price above or below the cost of production was what signaled an imbalance of supply and demand, and caused factors of production to be moved from one use to another until the imbalance was corrected. As Thomas Hodgskin described it:

The governments of some countries, distinguished for wisdom, noticing the evils resulting from variations in the seasons, have established public granaries to prevent them, and to equalize the operations of nature; but the merchant buying when and where commodities are cheap, and only selling when and where they are dear, does, in fact, perform, but infinitely better than governments can, all the functions of public granaries.³

The forms of exploitation entailed in the older, misnamed "laissez-faire," variant of capitalism Tucker remarked on in the nineteenth century, resulted from violation of the original, negative version of the cost principle: cost exceeded price as a result of unequal exchange, with tenants, workers, and consumers paying assorted forms of scarcity rent on land, capital, and goods subject to "intellectual property." And as we saw in Chapter Eleven, such forms of unequal exchange continue to operate in corporate capitalism up to the present day. So-called "intellectual property," in particular, results in product prices which reflect mainly rents on artificial property rights rather than actual material and labor costs.

But many more of the ills specific to *corporate* capitalism, on the other hand, result from violations of the positive version of the principle: the supply of transportation, energy, education, and other production inputs to privileged enterprises *below* their market costs. Murray Rothbard described the effects of such subsidies:

"Free" services are particularly characteristic of government. Police and military protection, fire-fighting, education, parks, some water supply come to mind as examples. The first point to note, of course, is that these services are not and cannot be truly *free*. A free good, as we saw early in this book, would not be a good and hence not an object of human action; it would simply exist in superabundance for all. If a good does not exist aplenty for all, then the resource is scarce, and supplying it costs society other goods forgone. Hence it cannot be free. The resources needed to supply the free governmental service are extracted from the rest of production. Payment is made, however, not by users on the basis of their voluntary purchases, but by a coerced levy on the taxpayers. A basic split is thus effected between *payment* and *receipt of service*. This split is inherent in all government operations.

Many grave consequences follow from the split and from the "free" service as well. As in all cases where price is below the free-market price, an enormous and excessive demand is stimulated for the good, far beyond the supply of service available. Consequently,

³ Thomas Hodgskin, *Popular Political Economy: Four Lectures Delivered at the London Mechanics' Institution* (London: Printed for Charles and William Tait, Edinburgh, 1827), p. 175.

there will always be “shortages” of the free good, constant complaints of insufficiency, overcrowding, etc. An illustration is the perpetual complaints about police insufficiency, particularly in crime-ridden districts, about teacher and school shortages in the public school system, about traffic jams on government-owned streets and highways, etc. In no area of the free market are there such chronic complaints about shortages, insufficiencies, and low quality service. In all areas of private enterprise, firms try to coax and persuade consumers to buy more of their product. Where government owns and operates, on the other hand, there are invariably calls on consumers for patience and sacrifice, and problems of shortages and deficiencies continually abound. It is doubtful if any private enterprise would ever do what the New York City and other governments have done: exhort consumers to use *less* water. It is also characteristic of government operation that when a water shortage develops, it is the *consumers* and not the government “enterprisers” who are blamed for the shortage. The pressure is on consumers to sacrifice, and to use less, while in private industry the (welcome) pressure is on entrepreneurs to supply more....

Free supply not only subsidizes the users at the expense of non-using taxpayers; it also misallocates resources by failing to supply the service where it is most needed. The same is true, to a lesser extent, wherever the price is under the free-market price. On the free market, consumers can dictate the pricing and thereby assure the best allocation of productive resources to supply their wants. In a government enterprise, this cannot be done. Let us take again the case of the free service. Since there is no pricing, and therefore no exclusion of submarginal uses, there is no way that the government, even if it wanted to, could allocate its services to their most important uses and to the most eager buyers. All buyers, all uses, are artificially kept on the same plane. As a result, the most important uses will be slighted. The government is faced with insuperable allocation problems, which it cannot solve *even to its own satisfaction*. Thus, the government will be confronted with the problem: Should we build a road in place A or place B? There is no rational way whatever by which it can make this decision. It cannot aid the private consumers of the road in the best way. It can decide only according to the whim of the ruling government official, i.e., only if the *government officials* do the “consuming,” and not the public. If the government wishes to do what is best for the public, it is faced with an impossible task.⁴

The irrationality and misallocation that result from this divorce of payment from benefit, or of cost from decision-making authority, has been a central theme of this book. Indeed, Oppenheimer's "political means" might be *defined* as the divorce of payment from benefit. The fundamental purpose of power is to receive benefits at others' expense, through the exercise of unaccountable power over them. And this inevitably follows from the authority relationship and from hierarchy, wherever it is found. Authority breeds conflict of interest wherever it is found, whether in the government sector or the nominal private sector. For example, as Lloyd Dumas described it,

The assumption that control is exercised by the cost bearers is nontrivial, and in some cases unrealistic. For instance, taxpayers bear the cost of the salaries of government employees. Yet, though rational, taxpayers are not necessarily in control of government

⁴ Murray Rothbard, *Man, Economy, and State: A Treatise on Economic Principles* (Auburn, Ala.: Ludwig von Mises Institute, 1962, 1970, 1993), pp. 819-820.

personnel decisions. Hence it is quite possible that individuals will be hired whose salaries exceed the value of their work output in the eyes of the taxpayers. In the opinion of the government administrators doing the hiring, the value of the salaries may far exceed the opportunity cost of that use of budgeted funds. But the administrators are not paying the salaries--the taxpayers are. This situation is not peculiar to government. Managers of private corporations, for example, may engage in bureaucratic empire-building and hire people whose work output is less valuable than its cost, in the eyes of the stockholders and/or consumers who share the salary costs. It is thus the judgment of the decision makers that holds sway when the decision makers and the cost bearers are different individuals.⁵

A major part of the economy consists of things which are paid for but produce no value, the moral equivalent of digging holes and filling them in again. This leads to the obvious question, Dumas writes,

Why would workers be paid identical salaries to provide services of... radically different inherent economic value? In fact, why would economically valueless output be associated with a nonzero money value?...

[One possible answer]: there may be a discrepancy between the value of an activity or output to the decision maker who authorizes its purchase and its value to those who actually pay the price.⁶

One example he gives for the expansion of unproductive consumption of inputs is administrative activity within an organization. The cost to managers

of expanding the bureaucratic control apparatus is low, while the value to them of such expansion may well be substantially higher. (In standard neoclassical terminology, to the managers the marginal cost of expansion will tend to be less than its marginal utility.) The managers have the relevant decision-making power: they are in operational control of hiring and purchasing decisions. Therefore, as long as the value of expansion exceeds its costs from *their* perspective, they will continue to expand the bureaucracy.⁷

In other words, decision makers aim at maximizing net utility, not to society as a whole, but to themselves personally. If their power enables them to shift marginal cost downward relative to benefits, they will consume an input beyond its point of diminishing social utility.

Economist Kenneth Boulding, our old acquaintance from Chapter Five (and the father of what is called grants economics), wrote the introduction to Dumas' book. In it he referred to subsidies as an example of the "implicit grants economy," a term originally of his invention.

⁵ Lloyd Dumas, *The Overburdened Economy: Uncovering the Causes of Chronic Unemployment, Inflation, and National Decline*. (Berkeley, Los Angeles, London: University of California Press, 1986), pp. 39-40.

⁶ *Ibid.*, pp. 42-43.

⁷ *Ibid.*, pp. 66-67.

Such subsidies result in massive amounts of waste being built into the basic structure of the economy. For example, the centralization of the economy and concentration of industry result, among other things, from artificially cheap transportation and energy inputs. So do inefficiently energy-intensive forms of production. Subsidized research and development and technical education lead, as we saw in Chapter Three, have distorting effects on the choice of production technology: specifically, the choice of high-cost, capital-intensive forms of production that create entry barriers, promote hierarchy, and also promote capital substitution and the deskilling of labor. The centralizing effects of transportation subsidies, likewise, were described in Chapter Three.

A. Peak Oil and the "Long Emergency"

The application of the cost principle to the corporate economy would result in radical changes: a shift toward decentralized, small-scale production for local markets; toward energy-efficient industry and housing; toward walkable, mixed-use communities. One of the best summaries of the changes required comes from Herman Koenig:

Undoubtedly the first thing we will try to do as the real cost of energy increases and it becomes less available, is make adjustments to more efficient technologies...; they are frequently called "technological fixes." We can and will put more insulation in our homes, opening windows a little more in the summer, turning down the thermostat in winter. Detroit will build a more efficient automobile for you, you'll get 45 or 50 miles per gallon instead of 16 in a few years. We will transfer some of the freight from the highways to the railroads. Such technological adjustments have been estimated to have the potential of saving thirty to forty percent of our present energy budget. Such adjustments will not affect our life style very much, but the "slack" will run out after a few years.

The next large class of adjustments relate to our mobility. Fifty-four percent of our petroleum is used for transportation. As petroleum becomes less available, and the price rises significantly, our mobility will go down. How will this affect the landscape? We will undoubtedly find that what we need to re-invent are medium-sized communities built around a small electrical generating facility that heats our homes and commercial buildings with the residual heat. It is called district heating. These communities would also serve as transit terminal connections to other communities, and they will have a diversified commerce and some decentralized, light industry. Such communities are much more energy-efficient, since most of the elements of everyday living are near at hand.

A third class of adjustments is to be found in the area of product durability. Just as small is beautiful, age will be beautiful. we have the technology to significantly increase the durability of most of our products. We can build a refrigerator that will outlive its human owner. Detroit is beginning to realize that it should develop cars that will last perhaps twice as long as present cars. If we increase product durability, as we must, there will be a tremendous opportunity not only for reducing energy requirements, but also the impact on

our environment.⁸

Whether or not the state ceases to subsidize resource consumption and otherwise distort the market in favor of large-scale organization and centralization, input crises like Peak Oil are likely to make the cost principle felt sufficiently to result in such changes.

A common theme in the popular media today is that "human ingenuity" will find some magic formula which will allow the current American form of social organization (economic centralization, large-scale production for large market areas, suburban sprawl and the commuter society, the soccer mom SUV lifestyle, thousands of passenger jets in the air 24/7, etc.) to continue unchanged--but at lesser cost, and with reduced greenhouse emissions and dependence on foreign oil. But this is a fairy tale. State capitalism is headed for a crisis of inputs, as we saw in Chapter Four, the inevitable outcome of the internal contradictions that result from its having been built around subsidized inputs in the first place. The very act of subsidizing inputs leads to escalating demand faster than the state can subsidize them, until things reach a breaking point.

The Western industrial economies have become dependent on extensive inputs of long-distance shipping, to the point of insanity. Hedrick Smith, attempting to illustrate the irrationality of the Soviet economy, used the example of a trainload of concrete beams traveling from Leningrad to Moscow, passing a trainload of identical beams traveling from Moscow to Leningrad. E.F. Schumacher, in *Good Work*, wrote:

When you travel up the big motor road from London you find yourself surrounded by a huge fleet of lorries carrying biscuits from London to Glasgow. And when you look across to the other motorway, you find an equally huge fleet of lorries carrying biscuits from Glasgow to London. Any impartial observer from another planet would come to the inescapable conclusion that biscuits have to be transported at least six hundred miles before they reach their proper quality.⁹

James Kunstler explains why the American car culture and "warehouses on wheels" industrial culture are finished:

Everywhere I go these days, talking about the global energy predicament on the college lecture circuit or at environmental conferences, I hear an increasingly shrill cry for "solutions." This is just another symptom of the delusional thinking that now grips the nation, especially among the educated and well-intentioned.

I say this because I detect in this strident plea the desperate wish to keep our "Happy Motoring" utopia running by means other than oil and its byproducts. But the truth is that no

⁸ Herman Koenig, "Appropriate Technology and Resources," in Richard C. Dorf and Yvonne Hunter, eds., *Appropriate Visions: Technology the Environment and the Individual* (San Francisco: Boyd & Fraser Publishing Company, 1978). p. 259. [247-259]

⁹ E. F. Schumacher, *Good Work* (New York, Hagerstown, San Fransisco, London: Harper & Row, 1979), p. 19.

combination of solar, wind and nuclear power, ethanol, biodiesel, tar sands and used French-fry oil will allow us to power Wal-Mart, Disney World and the interstate highway system -- or even a fraction of these things -- in the future. We have to make other arrangements.

The public, and especially the mainstream media, misunderstands the "peak oil" story. It's not about running out of oil. It's about the instabilities that will shake the complex systems of daily life as soon as the global demand for oil exceeds the global supply. These systems can be listed concisely:

The way we produce food

The way we conduct commerce and trade

The way we travel

The way we occupy the land

The way we acquire and spend capital

And there are others: governance, health care, education and more....

....The idea that we can become "energy independent" and maintain our current lifestyle is absurd....

So what are intelligent responses to our predicament? First, we'll have to dramatically reorganize the everyday activities of American life. We'll have to grow our food closer to home, in a manner that will require more human attention. In fact, agriculture needs to return to the center of economic life. We'll have to restore local economic networks -- the very networks that the big-box stores systematically destroyed -- made of fine-grained layers of wholesalers, middlemen and retailers.

We'll also have to occupy the landscape differently, in traditional towns, villages and small cities. Our giant metroplexes are not going to make it, and the successful places will be ones that encourage local farming.

Fixing the U.S. passenger railroad system is probably the one project we could undertake right away that would have the greatest impact on the country's oil consumption. The fact that we're not talking about it -- especially in the presidential campaign -- shows how confused we are. The airline industry is disintegrating under the enormous pressure of fuel costs. Airlines cannot fire any more employees and have already offloaded their pension obligations and outsourced their repairs. At least five small airlines have filed for bankruptcy protection in the past two months. If we don't get the passenger trains running again, Americans will be going nowhere five years from now.¹⁰

I should note, in passing, that--even if giant metroplexes *don't* "make it"--there's no

¹⁰ James Kunstler, "Wake Up America. We're Driving Toward Disaster," *Washington Post*, May 25, 2008 <http://www.washingtonpost.com/wp-dyn/content/article/2008/05/23/AR2008052302456_pf.html>.

necessity for their collapse to be sudden or catastrophic. If their economies are sufficiently restructured, their present sites can probably support at least a majority of their current population. That would require, among other things, dedicating lawns and other forms of greenspace to raised-bed horticulture and edible landscaping, and heroic efforts at conserving rainwater. It would require the growth of networked economies, the growth of commercial centers in existing monoculture suburbs, and local exchange systems and division of labor based on household production and crop specialization. One step toward a local manufacturing economy, based on the informal and household sectors, is the use of the better-equipped hobbyists' workshops to custom machine replacement parts for machinery, and the creation of neighborhood repair/recycling/remanufacture shops, as discussed in Chapter Fourteen.

Jeff Vail explains, in greater detail, both why there is no magic technological fix for Peak Oil, and what a healthy economic system post-Peak Oil will entail.¹¹ Quality of life, he observes, is a function of energy inputs ("opportunities for work") and the efficiency with which the energy is directed to work ("technics"). Quality of life can be increased either by tapping new sources of concentrated energy, or by using the energy we have more efficiently.

The problem, he says, is that the greatest sources of concentrated energy are almost certainly reaching their peak. The only energy sources with a high "EROEI" (i.e., a concentrated energy source that produces a great deal more energy than is required to tap it) are fossil fuels. The only alternative energy sources with a fairly high EROEI, wind and hydro, won't be available in quantities even remotely sufficient to replace current energy consumption from fossil fuels. Simply put, there is no concentrated energy source in the world with an EROEI as high as that of fossil fuel, and energy sources with an EROEI significantly higher than one can take up only a small part of the slack.

Therefore, if quality of life is to be maintained, the only solution is "improving technics--improving how we use the energy that we *do have* to create quality of life."

it seems very likely that there is ample room to improve our technics. IF we accept this latter proposition—that we can improve our utilization of energy to create quality of life—then doesn't it make the most sense to focus our mitigation efforts there? I have great confidence in the power of human ingenuity to solve our problems. However, when human ingenuity meets the laws of physics and thermodynamics, I don't think they will bend to our will. Design of technics, on the other hand, seems to be an area where human ingenuity has unending room for advancement....

My hypothesis is that our quality of life, both collectively and individually, is more dependent on how we use our energy than on how much of it we use. This hypothesis continues that we can better influence our quality of life through improving technics than

¹¹ Jeff Vail, "The Design Imperative," *A Theory of Power*, April 8, 2007
<<http://www.jeffvail.net/2007/04/design-imperative.html>>.

through increasing energy consumption....

Improving technics is, of course, the flip side of the conservation coin. If our quality of life is dependent on levels of energy consumption, then conservation must decrease quality of life. For that reason, the conservation measures that work are those that are based on technics—ways of using energy more efficiently to achieve the same quality of life.

As an alternative paradigm for technics, in promoting a high quality of life with dramatically reduced energy inputs, Vail proposes three organizing principles: "decentralized, open source, and vernacular." As an example, he contrasts the Tuscan village with the American suburb:

How is the Tuscan village decentralized? Production is localized. Admittedly, everything isn't local. Not by a long shot. But compared to American suburbia, a great percentage of food and building materials are produced and consumed in a highly local network. A high percentage of people garden and shop at local farmer's markets.

How is the Tuscan village open source? Tuscan culture historically taps into a shared community pool of technics in recognition that a sustainable society is a non-zero-sum game. Most farming communities are this way—advice, knowledge, and innovation is shared, not guarded. Beyond a certain threshold of size and centralization, the motivation to protect and exploit intellectual property seems to take over (another argument for decentralization). There is no reason why we cannot share innovation in technics globally, while acting locally—in fact, the internet now truly makes this possible, leveraging our opportunity to use technics to improve quality of life.

How is the Tuscan village vernacular? You don't see many "Colonial-Style" houses in Tuscany. Yet strangely, in Denver I'm surrounded by them. Why? They make no more sense in Denver than in Tuscany. The difference is that the Tuscans recognize (mostly) that locally-appropriate, locally-sourced architecture improves quality of life. The architecture is suited to their climate and culture, and the materials are available locally. Same thing with their food—they celebrate what is available locally, and what is in season. Nearly every Tuscan with the space has a vegetable garden. And finally (though the pressures of globalization are challenging this), their culture is vernacular. They celebrate local festivals, local harvests, and don't rely on manufactured, mass-marketed, and global trends for their culture nearly as much as disassociated suburbanites—their strong sense of community gives prominence to whatever "their" celebration is over what the global economy tells them it should be.

Brian Kaller's model of the vernacular post-Peak Oil community is the American equivalent of a Tuscan village: Mayberry. Or rather, a higher-tech version of the American Main Street lifestyle before the triumph of the car culture, symbolized by Mayberry. Kaller also takes issue with Kunstler's apocalyptic view of the Peak Oil transition.

In fact, peak oil will probably not be a crash, a moment when everything falls apart, but a series of small breakdowns, price hikes, and local crises....

...The Long Emergency will be an era, not an event, and the challenge will be to see the larger trends as they unfold and to retool our habits and infrastructure, not to wait for major developments to "hit."....

The Long Emergency could look like the Victory Garden movement during World War II, when Americans responded to a national threat by turning backyards into gardens and freeing food production for the troops. Within a couple of years, such gardens were producing almost half of Americans' vegetables. Contrary to popular myth, the movement was not a big-government initiative—the Roosevelt administration discouraged the effort at first, unsuccessfully, until it joined in and turned the White House lawn into crops. Similarly, Americans formed scrap and rubber drives and practiced emergency drills.

The same habits that helped us through that crisis—recycling, thrift, gardening— will help with this one....

While peak-oil literature often considers the world to be at the end of a 200-year industrial era, it is only in the last few decades that we have truly binged. By some estimates, the world has used as much oil in the last 25 years as in the entire previous century. Restoring a low energy world, for many Americans, would not mean going back two centuries.

Take one of the more pessimistic projections of the future, from the Association for the Study of Peak Oil, and assume that by 2030 the world will have only two-thirds as much energy per person. Little breakdowns can feed on each other, so crudely double that estimate. Say that, for some reason, solar power, wind turbines, nuclear plants, tidal power, hydroelectric dams, biofuels, and new technologies never take off. Say that Americans make only a third as much money, cut driving by two thirds. Assume that extended families have to move in together to conserve resources and that we must cut our flying by 98 percent.

Many would consider that a fairly clear picture of collapse. But we have been there before, and recently. Those are the statistics of the 1950s—not remembered as a big time for cannibalism.¹²

The Scale of Possible Savings on Energy Inputs

Fortunately, Vail's optimism regarding the potential of technics seems to be fully warranted. Chapter Fourteen of this book, on decentralized production technology, deals with the feasibility of a decentralized economy organized around small-scale manufacturing for local markets. Vail himself links to a number of interesting initiatives.

The Energy Descent Action Plan (EDAP),¹³ developed by students in the Practical

¹² Brian Kaller, "Future Perfect: Stop Worrying and Learn to Love Expensive Oil," *The American Conservative*, August 25, 2008, pp. 23-26.

¹³ *Kinsale 2021: An Energy Descent Action Plan--Version.1.2005*. By Students of Kinsale Further Education College. Edited by Rob Hopkins (Kinsale, Ireland: Kinsale Further Education College, 2005) <http://transitionculture.org/?page_id=104>.

Sustainability course at Kinsale Further Education College, is a detailed agenda for managing the Irish town of Kinsale's transition from a high-energy consumption to a low-energy consumption community. The study assumes that Kinsale's available fossil fuel inputs in 2021 will be half those available in 2005, and recommends measures for managing an orderly transition. To take one example, in the area of food, by 2021 lawns have disappeared, and landscaping consists entirely of edible plant permaculture. As we have already seen in this book--repeatedly--and will see again in Chapter Fourteen, the total labor required for growing food at the point of production is less than that required to earn the money to buy factory farmed produce. Taking into account also the savings in labor and money for lawn maintenance, and the improved quality of food, this would clearly be a net improvement in quality of life.

The Transition Town¹⁴ movement in the UK, beginning with Totnes and now including some seventy towns, is another good example. Some of these towns, including Totnes, have developed EDAPs of their own.¹⁵ Finally, Vail mentions Richard Heinberg's *Powerdown*,¹⁶ which has inspired various eco-village projects in the British Isles.

Cuba has already made--in a much briefer and rockier manner--a transition comparable to what the West is likely to undergo with Peak Oil in the coming decades. Until the late 1980s, Cuba's agricultural economy was a Soviet wannabe, based on heavy mechanization and use of chemicals; the Soviet state-socialist model of agriculture, at least ideally, was as if Cargill or ADM had turned the farms of an entire country into one giant agribusiness plantation, and then the state had expropriated the corporation and put it under a state ministry. But with the collapse of the Soviet bloc in 1989 and of the USSR itself in 1991, and the cutoff of their "fraternal assistance," the Cuban economy was deprived of the inputs necessary for a Soviet-style agricultural model. There were drastic cutbacks in electric power and transportation, in the fuel and spare parts for those big gee-whizzy combines, and the oil necessary for chemical inputs. Left with an economy largely geared toward cash crops of sugar, and deprived of the Soviet-bloc markets for that sugar at subsidized prices, Cuba suffered something like a one-third reduction in average daily caloric intake. But more than a decade later, Bill McKibben noticed a difference:

Cuba had learned to stop exporting sugar and instead started growing its own food again, growing it on small private farms and thousands of pocket-sized urban market gardens—and, lacking chemicals and fertilizers, much of that food became de facto organic. Somehow, the combination worked. Cubans have as much food as they did before the Soviet Union collapsed. They're still short of meat, and the milk supply remains a real problem, but their caloric intake has returned to normal—they've gotten that meal back.

¹⁴ Transition Town Wiki <<http://www.transitiontowns.org/>>

¹⁵ Transition Town Totnes <<http://totnes.transitionnetwork.org/>>

¹⁶ Richard Heinberg, *Powerdown: Options and Actions for a Post-Carbon World* (New Society Publishers, 2004).

In so doing they have created what may be the world's largest working model of a semi-sustainable agriculture, one that doesn't rely nearly as heavily as the rest of the world does on oil, on chemicals, on shipping vast quantities of food back and forth.¹⁷

As the *Freedom Democrats* blog points out, Cuba's success resulted from the Cuban government simultaneously rejecting the Washington Consensus model of focusing on cash-crop exports, and loosening up state socialist impediments to bottom-up innovation domestically.

At the time, Cuba imported 60 percent of its food and was highly dependent on the Soviet Union for oil. From 1994 and 1995 onward, Cuba's economy and in particular its agricultural system have recovered. It has been considered a model for how other nations may adapt to peak oil and the decline in fossil fuels....

Of course, I noticed how many of the changes occurred from the bottom up and wouldn't have been possible if the communist government hadn't gotten out of the way. The growth in farmers markets and urban gardens, which have enabled half of the food consumed in Havana to come from small gardens in Havana, wouldn't have faced greater obstacles if the Cuban government hadn't backed down and recognized the right of the individual to buy and sell produce in a small-scale free market. Going in the opposite direction of the advice handed out by the IMF and World Bank, Cuba actually dropped its emphasis on cash crops in tobacco, sugar, and citrus fruit and turned their large state run plantations into smaller cooperatives where individual farmers are rewarded based on their productivity. Overnight, Cuban agricultural had to become organic agriculture because of the lack of oil. Animals replaced tractors, earthworms replaced petroleum-based fertilizers.¹⁸

According to McKibben, just about every previously vacant lot in Havana is an intensely cultivated farm, averaging 5 kg. of produce per square meter. The city gets "nearly its entire vegetable supply, and more than a token amount of its rice and meat," through such urban farming.¹⁹

Intervale, a 200-acre community-supported agriculture farm in Burlington, Vermont, supplies "7 or 8 percent of all the fresh food consumed in Burlington."²⁰

A lot of the price premium on local, organic food stems from the fact that it is still consumed in insufficient quantities in most localities to maximize economies in

¹⁷ Bill McKibben, "The Cuba diet: What will you be eating when the revolution comes?" *Harpers*, April 2005. <<http://www.harpers.org/archive/2005/04/0080501>>.

¹⁸ "Two Pathways," *Freedom Democrats*, February 11, 2008 <<http://freedomdemocrats.org/node/2541>>. Oxfam America also did a study on Cuba's agricultural transition: Minor Sinclair and Martha Thompson, "Cuba: Going Against the Grain" (Oxfam America: June 2001) <http://www.oxfamamerica.org/newsandpublications/publications/research_reports/art1164.html>.

¹⁹ Bill McKibben, *Deep Economy: The Wealth of Communities and the Durable Future* (New York: Times Books, 2007), pp. 74-75.

²⁰ *Ibid.*, p. 80.

distribution: rather than taking a full truckload to a single supermarket, a farmer often must distribute the load among several stores in an area. Another source of high prices is entrepreneurial profit, reflecting the fact that supply hasn't kept up with demand. When two things occur (both of which almost certainly will)--a much larger portion of the food consumed in each local market is local and organic, and sufficient food is grown locally to meet the demand--the price should be far more competitive. That's true even with the subsidies to large-scale chemical agribusiness, which simply won't begin to compensate for the exploding costs of long-distance transportation and chemical fertilizer.

But starting even from where we are now, there is (as the authors of *Natural Capitalism* argue)²¹ an abundance of low-hanging fruit which could reduce energy consumption by half or three-quarters in industry after industry, and at the residential level, with virtually no negative impact on quality of life. That Americans have not found this low-hanging fruit even worth the bother of picking, speaks volumes about the distorting effect of subsidized energy and transportation.

The authors of *Natural Capitalism* compare subsidized energy consumption in the American "market" economy to that in the old Soviet Union, where economic planners priced energy at a third of the actual cost of providing it.²²

Major savings, for example, could be achieved through better urban design. The main force behind urban sprawl is disregard of the cost principle. As we saw in Chapter Four, local governments build subsidized freeway systems and ever further outlying bypasses in order to "relieve congestion," only generating *new* congestion as the new roads fill up with new traffic from the new subdivisions and strip malls that line them. As the saying goes, trying to relieve traffic congestion by building more roads is like trying to lose weight by letting out your belt.

Suburban developments commonly receive subsidized utility connections at the expense of ratepayers in the old, inlying parts of town. School boards close down old neighborhood schools to build new ones out by the new subdivisions.

In my own area of Northwest Arkansas, voters in the city of Fayetteville recently (September 2006) approved a sales tax increase to meet cost overruns on an upgrade of the city sewer system. The only alternative, Mayor Dan Coody said, would be an increase of 30% or more in sewer rates. Of course, that's what happens when we allow politicians to determine the range of "available alternatives" for us. Since the increased burden on the old sewer system resulted almost entirely from suburban housing additions and runoff from big box store parking lots, the just solution would have been assessing cost-based fees for sewer hookup in new development. But Coody not only deliberately left this choice out of the list of "available alternatives"; he simultaneously appealed to the voters'

²¹ Paul Hawken, Amory Lovins, L. Hunter Lovins, *Natural Capitalism: Creating the Next Industrial Revolution* (Boston, New York, London: Little, Brown and Company, 1999).

²² *Ibid.*, p. 42.

greed by reminding them that the sales tax would be paid by out of town visitors as well as residents. As the saying goes, it's always easier to con a greedy man. So the voters, eager to get something for nothing, taxed their own groceries in order to spare Jim Lindsey (the area real estate baron) the indignity of impact fees.

Local government, typically, is a showcase property of the real estate industry. But what's really amusing is that Coody himself was originally the champion of the local "progressive" community, and ran a campaign based on "smart growth" and "new urbanist" rhetoric. Since he was elected, though, his main focus has been on promoting yuppie aesthetic sensibilities and a gentrified downtown friendly to limosine liberals, rather than changing the perverse market incentives that reward sprawl.

Federal home mortgage redlining, which subsidizes the suburban real estate and housing industries and at the same time discriminates against those wanting to buy houses in older neighborhoods.

Urban congestion is promoted by the availability of free or underpriced parking downtown, subsidizing those who drive in from the suburbs at taxpayer expense. For example, "[m]ost American building regulations require developers to provide as much parking for each shop, office, or apartment as people would demand *if parking were free*."²³

In addition, zoning prohibits mixed-use development, and thereby inflates the need for transportation to get from the cul de sac to where one shops and works. The neighborhood grocery store has been zoned out of existence, along with all but the most informal and unobtrusive of home businesses. Affordable housing in the downtown commercial district (e.g. walkup apartments over shops), likewise, is prohibited by zoning.²⁴ As an illustration of how firmly entrenched standard suburban design is in local regulations, and how (as we already saw in Chapter Four) licensing and credentialling artificially raise costs, consider the experience of Sim Van der Ryn:

In setting up our rural centers in Farallones Institute, where we are trying to develop and live and research an ecologically sound, right way to live, we ran into all kinds of problems. We went to the county initially with a plan for the use of a piece of land but it wasn't five-acre ranchettes, it did not give everybody his own compactor and kitchen, and so on, because we had grouped some of our community facilities. They say, "Ah ha, you're an organized camp." We said, "No, we're not organized, we're not the boy scouts, sorry." They said, "Well, you're a school." We said, "We are a school too. But we're more than a school, but besides we don't want to be zoned as an institution which puts all other kinds of requirements on us." Well, it was a very interesting process and we didn't fit into any category and we still don't. They finally decided we were a kind of school you see, and then there was a set of health and safety laws that apply to schools.

²³ Ibid., p. 42.

²⁴ See, for example, James Kunstler, *The Geography of Nowhere*, for the effects of imposing car culture through zoning laws.

Now, for example, as part of our teaching program we grow our own food. We have our own animals. We can our own food. Well, on the first visit from the health inspector, he looked in the refrigerator and saw some bottles of milk. And he said, "Where did this milk come from?" I replied, "From our cow." Well we had a certified letter the next day. "You are in violations of the Health and Safety Code for drinking milk from an unauthorized source." Our kitchen was technically a restaurant and we were required to have a changing room for our waitresses.

Well, it's all amusing now; it wasn't so amusing then, because they can turn you out of your home for doing things that make sense.²⁵

The combined effect of all these subsidies to sprawl is that there are two separate communities for each of us: a bedroom community where we live, and a different community where we work and shop--each with its own complete set of utilities, and joined by an expensive transportation infrastructure for driving back and forth between them.

The present car-centered pattern of urban design is the result, not (as pseudo-libertarian apologists for the car culture would have us believe) of the market, but of decades of government-imposed social engineering.

In Europe, where urban densities are several times higher, nearly half of trips are by foot or bicycle, and another 10% by public transit--compared to 87% by car in the U.S. Even something as low-tech as allowing mixed-use development would result in huge savings. For example, in the 1970s Portland officials estimated that reviving neighborhood grocers, alone, would be enough to reduce gasoline consumption by 5%.²⁶

Other forms of waste, also associated with urban sprawl, likewise result from the distorting effects of government intervention in the market. For example, zoning regulations restrict the efficient use of gray water, so that people are forced to use drinking water to water lawns and hose off driveways.²⁷ Likewise, restrictions on composting toilets and enforced use of water-based sanitation systems mean that drinking water is wasted to flush wasted fertilizer downstream to the ocean.²⁸ According to Madhu Suri Prakash, "[m]ore than 40 percent of the water available for domestic purposes is used for transporting shit."²⁹ Water utilities, more often than not, deal with droughts by threatening administrative penalties for watering lawns, and the like, instead of charging scarcity rates or increasing rates for higher levels of usage. But in those areas where utilities resort to the latter cost-based incentives, consumers make drastic

²⁵ Sim Van der Ryn, "Working with and through Institutions," in Dorf and Hunter, eds., pp. 272-273.

²⁶ *Natural Capitalism*, p. 45.

²⁷ *Ibid.*, p. 214.

²⁸ *Ibid.*, p. 221.

²⁹ Madhu Suri Prakash, "Compost Toilets and Self-Rule," *Yes!*, Winter 2008
<<http://www.yesmagazine.org/article.asp?id=2102>>.

reductions in water consumption on their own initiative, without the need for neighborhood informers.³⁰ Switching to biologically, rather than chemically based sewage treatment, and decentralizing sewage systems to the neighborhood level, not only reduces cost but closes the loop by providing safe fertilizers for local use. Costs for purifying drinking water are also reduced.³¹

The same is true of building design and industrial processes. The radical effects of a thoroughgoing application of the cost principle, in these areas, are suggested by a wealth of material in *Natural Capitalism*. The sheer scale of potential savings in energy consumption that are feasible, from a purely technical standpoint, is astonishing. The central theme of the book, as stated by the authors, is that "90 to 95 percent reductions in material and energy are possible in developed nations without diminishing the quantity or quality of the services that people want."³²

Some critics of environmentalism and energy conservation (e.g. George Reisman, a regular commentator at Mises.Org) portray energy saving as tantamount to a catastrophic reduction in the standard of living--as though the energy input per unit of consumption were a fixed quantity, or the expenditure of energy were itself a measure of prosperity. Amory Lovins refers to "the bizarre notion that using less energy--or more often, failing to use much more energy--...means somehow a loss of prosperity."³³

The authors of *Natural Capitalism* document countless innovations, many of them laughably cheap compared to the energy savings they would produce. Some of the biggest savings involve, not changes in particular technologies, but in overall design philosophy. A "whole-system engineering" or "integrated design" approach, focused on the way components are put together, can sometimes achieve large energy savings with little or no increase in up-front cost--or even reduced up-front cost. It's true that energy-saving components may, taken individually, cost more than their conventional counterparts. But when systems are taken as a whole, efficiencies in one area may lead to greater savings in another, with a cumulative effect.

One good example is green building design. Passive solar design can reduce heating and cooling costs by eighty percent or more. An office building in Amsterdam uses 92% less energy than neighboring buildings, at a construction cost per square meter no greater than the market average.³⁴ Similar savings can be made in water consumption--for example, a housing development with natural drainage swales for rain water which actually reduce building cost by \$800 per home thanks to savings on expensive storm

³⁰ *Natural Capitalism*, p. 224.

³¹ *Ibid.*, pp. 228-29.

³² *Ibid.*, p. 176.

³³ Amory B. Lovins, *Soft Energy Paths: Toward a Durable Peace* (New York, Cambridge, Hagerstown, Philadelphia, San Francisco, London, Mexico City, Sao Paulo, Sydney: Harper & Row, Publishers, 1977), xiii.

³⁴ *Natural Capitalism*, pp. 82-83.

sewers, and at the same time cut water consumption for landscape irrigation by up to half.³⁵ The Rocky Mountain Institute's headquarters, despite only fifty-two frost-free days a year, cut heating costs by 99% and uses only two small woodstoves; and despite considerable investments in energy conserving technology (like superinsulation, and superwindows that gain net heat in winter), the overall building costs are less thanks to the savings on furnace and ductwork.³⁶

Passive design features, likewise, can reduce peak indoor temperature to 82 degrees even when outside temperatures are 104 and over--actually cooler than neighboring houses in which conventional air conditioning cannot keep up with the cooling burden.³⁷ While passive solar heating is comparatively well known, the principles of passive solar cooling are almost unknown. The temperature differential between the air and earth is potentially an enormous source of energy. As Jeff Vail describes it:

... while in Phoenix it may never get below 90 at night during some points in the summer, the temperature of the earth at 10' underground is always a nice 55-65 degrees F. A simple solar chimney on your home (roughly, imagine a normal chimney x 50%, with a single-glazed window on the South side and a black-painted vent pipe inside) will heat up and pull air rapidly out of your home. Now, for air intake, lay a "radiator", a network of pipes 10' underground that acts as a heat-exchanger with the thermal mass of the earth. As the solar chimney draws air out, you get nice, cool air blowing in through vents in your floor. 0 energy cost, 0 moving parts, simple technology, and it keeps your (well insulated) home at a comfortable temperature and well ventilated, even in Phoenix in August. Similar technology has been in use in vernacular architecture in the Middle East for thousands of years.

Here's the catch: because it's vernacular technology, and can be easily implemented in a decentralized fashion, there isn't much money to be made off this through a centralized/industrialized economic mode. But it works... this is the very stuff of freedom.³⁸

The conventional housing industry's tendency to ignore low-cost vernacular technology applies to the choice of building materials, as well. Claude Lewenz, in *How to Build a Village*, describes the savings his organization achieved by using locally available materials and "vernacular" techniques, and substituting whitewash (ordinary garden lime with a dab of glue added, about a dollar a gallon--"so cheap there is no margin in it to pay for salesmen, advertising, marketing and middlemen") for paint. "The upshot was an outstanding, iconic compound of four major buildings for a shell cost more commonly associated with kitset garages."³⁹ Vernacular techniques are characterized by "locally sourced materials with limited processing steps from raw material to finished..."⁴⁰

³⁵ Ibid., p. 83

³⁶ Ibid., p. 102.

³⁷ Ibid., p. 103.

³⁸ Jeff Vail, "Passive Solar & Independence," *A Theory of Power*, June 28, 2005 <<http://www.jeffvail.net/2005/06/passive-solar-independence.html>>.

³⁹ Claude Lewenz, *How to Build a Village* (Auckland, New Zealand: Village Forum Press and Jackson House Publishing Company, 2007), pp. 47-48.

⁴⁰ Ibid., p. 182.

Lewenz favors, in particular, use of low-cost bulk materials like ultra-lightweight concrete.⁴¹ Another example is the use of compressed earth blocks, produced by the open-source CEB machine developed at Factor-E Farm, which we discuss in Chapter Fifteen.

On a more modest level, we can see the cost principle at work in the demise of the McMansion. Starting in 2007, KB Home in Los Angeles pared its 3400 sq. ft. homes down to 2400, and this year is selling a line of 1230 sq. ft. homes. Other builders are moving in the same direction. This is a reversal of a two-decade trend, in which median house size grew from under 1600 to over 2200 sq. ft.⁴²

If solar power can be most cost-effectively adapted to heating space and water, grid electricity, by way of comparison, is about the least efficient method imaginable for doing so--burning fuel to generate electrical power at a large, centralized plant serving an enormous grid, transmitting it over long distances, and then converting it to heat through resistance at the point of consumption. And direct solar heat can be stored far more easily, through such means as water tanks and rock beds, than electrical power--thus reducing the storage and load-distribution problems of the electrical power grid.⁴³ On the other hand, electricity is ideal for providing shaft-power via motors, running electric lights and electronic radio and computer equipment, etc.⁴⁴ Simply shifting from electrical power to passive solar where it is suitable would eliminate the portion of fossil fuels currently consumed for residential and commercial heating and cooling. As for solar electricity itself, the designers at Open Source Ecology's Factor-E Farm community suggest that photovoltaics may be a comparatively inefficient means of generating electrical power, and express some skepticism as to whether its cost will be significantly reduced below that of fossil fuel competitors in the near future.⁴⁵ They're focusing, instead, on a solar turbine which uses the sun's heat to power a steam-driven generator.⁴⁶

Immense savings in losses from long-distance power distribution can also be achieved by using electricity only for those end-uses suited to electrical power (which constitute some ten percent of end-use energy needs), and then sizing and locating electrical generators in accordance with demand.⁴⁷ With power generated close to the point of

⁴¹ Ibid., p. 209.

⁴² Alex Veiga (Associated Press), "Homebuilders say 'less is more' with new homes," *MSNBC*, October 10, 2008 <<http://www.msnbc.msn.com/id/27122696/>>.

⁴³ Lovins, *Soft Energy Paths*, pp. 44-45.

⁴⁴ Amory Lovins, E. Kyle Datta, Thomas Feiler, Karl R. Rabago, Joel N. Swisher, Andre Lehmann, and ken Wicker, *Small is Profitable: The Hidden Economic Benefits of Making Electrical Resources the Right Size* (Snowmass, Colorado: Rocky Mountain Institute, 2002), p. 3.

⁴⁵ Benjamin Gatti, "The Bell Tolls for PV," *Factor E Farm Weblog*, September 5, 2008 <<http://openfarmtech.org/weblog/?p=322>>.

⁴⁶ "Solar Turbine--Open Source Ecology" <http://openfarmtech.org/index.php?title=Solar_Turbine>.

⁴⁷ Lovins, *Soft Energy Paths Soft Energy Paths: Toward a Durable Peace* (New York, Cambridge, Hagerstown, Philadelphia, San Francisco, London, Mexico City, Sao Paulo, Sydney: Harper & Row, Publishers, 1977), p. xiii.

consumption, still greater efficiencies can be achieved by designing as many machines and appliances as possible to run on DC current, rather than using AC inverters.⁴⁸

Another example is super-efficient cars: "a lighter, more aerodynamic car and a more efficient drive system work to launch a spiral of decreasing weight, complexity, and cost." While the greater cost of energy-efficient components may raise the overall cost of a moderately more efficient house or car, the whole-system effect of combining these efficiencies may result in lower overall cost for a *super*-efficient house or car.⁴⁹

A small electric motor company in New Zealand produces motors with 85% efficiency, that last for years because the reduction in vibration and heat--in addition to saving on energy loss from such inefficiency--also greatly reduces wear. Replacing existing electric motors with the more efficient kind would reduce American electrical power consumption by 11%.⁵⁰

The simple recycling of waste heat from power generators would by itself reduce America's total carbon emissions by 23%. Of total energy inputs into American generating plants, only a third is transformed into electricity. The other two-thirds are waste heat. Denmark gets around two-fifths of its electricity from such waste heat. The use of waste heat from industrial processes, whenever economical, would likewise reduce industrial energy consumption by 30% and total energy consumption by 11%.⁵¹ Alana Herro, at *Common Dreams*, concurs:

Recycling the heat that spews from industrial smokestacks may be one of the biggest opportunities for reducing greenhouse gas emissions, yet not many climate-savvy entrepreneurs are aware of it. When it comes to energy conservation, "[b]y and large, the world ignores the biggest, single most cost-effective, most profitable thing to do, which is recycle the energy that we're wasting," says Thomas Casten, chairman of the Illinois-based company Recycled Energy Development (RED).

Of the 500,000 smokestacks in the United States, the 47,500 stacks that produce waste heat above 260 degrees Celsius (500 degrees Fahrenheit) could produce at least 50,000 megawatts of power, says Casten. That's almost half the energy produced by the U. S. nuclear fleet, he notes....

RED retrofits smokestacks with "waste-heat recovery boilers" that use the stack's heat to produce steam to spin a turbine and generate electricity. The company uses similar technology to develop new, localized power plants that are at least two times as efficient as the average U.S. electric utility plant. According to Sean Casten, president and CEO of RED, the United States could conceivably continue producing the same amount of energy it does now, with half the fossil fuel, by recycling the waste heat from its factories and electric

⁴⁸ Ibid., p. 143.

⁴⁹ *Natural Capitalism*, p. 114.

⁵⁰ Lewenz, *How to Build a Village*, p. 113.

⁵¹ Ibid., pp. 246-47.

generating stations....

It typically takes three to four years for RED's projects to make back their initial investment in the heat-recycling equipment, a roughly 35 percent return.⁵²

And decentralized, distributed electrical production with small-scale community and neighborhood facilities is far better suited to waste heat recycling or cogeneration than are large plants serving a centralized grid. The smaller and more decentralized the power production, the more easily waste heat can be captured by the end-user.⁵³

Of course, as we shall see below, part of the problem is that under standard accounting practices the 35% return mentioned above isn't counted as a "return" in the ordinary sense. Capital expenditures for cost-reduction are expected to pay for themselves at what would amount to an extraordinary rate of return on ordinary capital investment.

Sometimes great savings are a matter of simple positioning. One simple example is the laboratory fume hood, which can be altered to require 60-80% less fan power by repositioning a single louver.⁵⁴ On a larger scale, reduced friction from using larger, straighter pipes in a factory pumping system enabled designers to scale the pumps down from 95 to seven horsepower.

...Schilham laid out the pipes first and then installed the equipment, in reverse order from how pumping systems are conventionally installed. Normally, equipment is put in some convenient and arbitrary spot, and the pipe fitter is then instructed to connect point A to point B. The pipe often has to go through all sorts of twists and turns to hook up equipment that's too far apart, turned the wrong way, mounted at the wrong height, and separated by other devices installed in between.

Besides the huge savings in power consumption, there was a significant reduction in capital outlays up-front, reduced complexity and lower maintenance costs.⁵⁵ Essentially, conventional factories were paying for pumps twelve times more powerful than necessary because engineers didn't even consider design efficiency at the whole-systems level.

Much of the art of engineering for advanced resource efficiency involves harnessing helpful interactions between specific measures so that, like loaves and fishes, the savings keep on multiplying. The most basic way to do this is to "think backward," from downstream to upstream in a system. A typical industrial pumping system, for example..., contains so many compounding losses that about a hundred units of fossil fuel at a typical

⁵² Alana Herro, "Clean Energy's Best-Kept Secret: Waste-Heat Recovery," *CommonDreams.org*, November 21, 2007 <<http://www.commondreams.org/archive/2007/11/21/5386/>>.

⁵³ Amory Lovins, E. Kyle Datta, Thomas Feiler, Karl R. Rabago, Joel N. Swisher, Andre Lehmann, and Ken Wicker, *Small is Profitable: The Hidden Economic Benefits of Making Electrical Resources the Right Size* (Snowmass, Colorado: Rocky Mountain Institute, 2002), pp. 284-285.

⁵⁴ *Natural Capitalism*, p. 64.

⁵⁵ *Ibid.*, pp. 115-116.

power station will deliver enough electricity to the controls and motor to deliver enough torque to the pump to deliver only ten units of flow out of the pipe....

But turn those ten-to-one compounding losses around backward, as in the drivetrain of the Hypercar, and they generate a one-to-ten compounded *saving*. That is, saving one unit of energy furthest downstream (such as by reducing flow or friction in pipes) avoids enough compounding losses from power plant to end use to save about *ten* units of fuel, cost, and pollution back at the power plant.

....This compounding effect also enables each successive component, as you go back upstream, to become smaller, simpler, and cheaper.⁵⁶

The overall systems efficiency from reduced weight in the Hypercar is a good example. Complex systems are often like Rube Goldberg drawings, with some components existing only to handle excessive size and other side-effects of inefficiency. A snowballing concatenation of increasingly costly components comes about, in the conventional large automobile, only to compensate for the greater handling difficulties of large size (e.g., power steering, which became necessary to control the heavy vehicles introduced after WWII). The decision to abandon the heavy internal combustion engine block makes possible a long series of savings in other systems down the line.

B. Path Dependency and Other Barriers to Increased Efficiency

Although engineering schools pay lip-service to elegance of systems design, actual practice is far different.

Designing a window without the building, a light without the room, or a motor without the machine it drives works as badly as designing a pelican without the fish. *Optimizing components in isolation tends to pessimize the whole system--and hence the bottom line.* You can actually make a system less efficient while making each of its parts more efficient, simply by not properly linking up these components. If they're not designed to work with one another, they'll tend to work against one another.

The new design required "not so much having a new idea as stopping having an old idea."⁵⁷

The problem, in part, is path-dependency. "Traditionally poor designs often persist for generations, even centuries, because they're known to work, are convenient, are easily copied, and are seldom questioned."⁵⁸ The inertia of professional culture is too great to overcome in a short period of time, unless some catastrophic change (like a massive increase in energy costs) provides sufficient incentive for new kinds of thinking. Even

⁵⁶ Ibid., pp. 121-22.

⁵⁷ Ibid., p. 117.

⁵⁸ Ibid., p. 118.

though relatively low-cost (or even cheaper) design changes can reduce costs by an order of magnitude, the corporate dinosaur can afford to use factor inputs in the old, inefficient way because it is one of a handful of firms in a competitive market, all doing things in the same way.

On an individual level, people fail to take advantage of low-cost alternatives as a result of nothing more than ingrained habit. Tom Bender, for example, chided the audience at an alternative technology seminar:

It's easy for us to sit in a room like this and debate abstractly the possibilities of appropriate technology without making connections with our own lives and our situation here and now. We've been discussing whether more appropriate technologies can be developed, yet this room is full of people who already have done the things we're wondering about and there's no structure in this conference to allow each of us to make connection with the others and deal in practical realities instead of abstractions.

It's my feeling that institutional "technologies" like this are more at the heart of technological problems in the United States than the problems of machinery. Along with that, I feel we have been ignoring the potential for a *better* quality of life in adjusting to resource limits we are facing. Lets look at both of these issues in our real situation here. We've been sitting for two days in this air-conditioned, artificially lighted room, talking about energy conservation while it is beautiful, sunny, and 74° outside. Yet no one has even suggested we do anything differently. This auditorium is actually well designed--all we have to do is pull back the curtains, open the doors, turn off the lights, and shut down the air conditioner--we're in a beautifully naturally lighted space with soft, fragrant breezes instead of stale cigarette smoke.⁵⁹

Beneficial new technologies and methods are often neglected for years before someone sees them as the solution to a problem. For example, in my own current field of employment, health care, it has been recognized for years that restoring normal intestinal flora through live culture yogurt or probiotic supplements is one of the fastest and most effective treatments for *clostridium difficile* and other gastrointestinal infections resulting from antibiotics. It should be a matter of course for a doctor to order one or the other treatment, automatically, when antibiotics are used. Yet virtually every time I get a patient with severe loose stools from *c. diff.*, the first two questions I ask are "were you on antibiotics?" and "is anyone giving you yogurt?" The answers, respectively, are "yes" and "huh?" Most doctors respond to any such suggestion, at best, with a patronizing "oh, sure, go ahead," mentally dismissing it as a bunch of "goddamn tree-hugging hippie crap."

The American economy has hardly begun to pick the low-hanging fruit of energy savings, because technology is still designed by graduates of an engineering culture built

⁵⁹ Tom Bender, "Appropriate Technology," in Richard C. Dorf and Yvonne L. Hunter, eds., *Appropriate Visions: Technology the Environment and the Individual* (San Francisco: Boyd & Fraser Publishing Company, 1978), p. 241.

on endless supplies of cheap, subsidized energy who can't be bothered to consider such matters. The entrenched design philosophy of the era of plentiful energy has yet to respond to the new age of energy scarcity.

The inertia of the corporate planned economy is compounded by misleading accounting practices, which--again--reflect the fact that restrained competition and a common corporate culture limit the consequences of being out of contact with reality. The problem is the same "MBA Disease" discussed in Chapters Seven and Eight: the tendency of corporate management to focus almost entirely on finance and marketing, while viewing the production process itself as a black box, and the concurrent tendency to strip firms of productive assets and otherwise milk them in order to inflate short-term earnings. The average corporation treats the projected payback time for an investment in energy-saving technology far more stringently than the rate of return on any other capital investment. Typically, an energy-saving technology must pay for itself in less than two years to be considered--an astronomical rate of return when considered as a capital investment.⁶⁰

The cost principle, applied consistently, is the one thing sure to result in rational consumption behavior over the long term. One good example, recounted in *Natural Capitalism*, is the period 1979-83 following the second oil shock. During that time, when the price of petroleum reached its highest level in real dollars to date, the economy grew by 19% while energy consumption actually shrank by 6%! The country got five times as much energy from increased efficiency as it got from new supply. The Swedish State Power Board estimated, in the 1980s, that fully utilizing available energy efficient technologies would by itself cut energy consumption in half--at a cost 78% lower than that of generating new energy.⁶¹ The general principle has been verified many times over: conservation, as a source of newly available energy, is far cheaper per unit than new generation of power.

The problem is that the cost differential has to reach a certain threshold, as it did in the late '70s and early '80s, before it is noticed by corporate dinosaurs. The oil shock of the early 1970s caused a significant cutback in the growth of energy consumption, but only the higher prices of the second oil shock were sufficient to result in an absolute decrease. The collapse of energy prices in the mid-80s led to a resumption of steep increases in energy consumption; the development of energy efficiencies, which had almost doubled 1975-85, stagnated.⁶² The bureaucratic corporation, competing with equally bureaucratic corporations in a cartelized industry, takes a long time to reach the threshold at which inefficiency costs are high enough for the consequences to be felt.

Interestingly, gasoline consumption for late 2007 is showed a modest decline for the first time since 1991, and the trend is expected to continue. Total miles traveled started

⁶⁰ Lovins et al, *Natural Capitalism*, pp. 266-67.

⁶¹ *Ibid.*, pp. 249-50.

⁶² *Ibid.*, pp. 253-54.

falling below their 2006 levels in October 2007, with December miles traveled dropping 3.9% from 2006 to 2007. Total miles drive are down about 5% through February of 2008. But as Kevin Drum points out, with population growth that's a 6% reduction in miles traveled per capita, and considering the average annual growth of 1.5% in recent years, it's down about 7.5% from the trendline.⁶³

A number of economic analysts have seen the recent (May 2008) rise of oil prices to \$130/barrel as a threshold or tipping point for the economy.

"We may finally have crossed the line where the price of crude actually matters for most companies," said Peter Boockvar, equity strategist at New York financial firm Miller Tabak & Co. "The stock market has been in la-la land when it comes to oil, but they got a pretty good dose of reality the last few days."...

Among the signs that the economy may finally be feeling the effect of rising oil prices was Ford Motor Co.'s announcement Thursday that it was abandoning any hope of making a profit this year or next now that sales of its gas-guzzling pickup trucks and Explorer sport utility vehicles have plunged.

And experts said that the other two U.S. automakers, General Motors Corp. and Chrysler, may be in even greater trouble.

Ford Chief Executive Alan Mulally said the industry had "reached a tipping point" where energy costs were fundamentally changing what kind of vehicles Americans buy.

Meantime, to cope with higher energy prices, American Airlines and United Airlines both raised ticket prices, and American announced plans to impose a new baggage-handling fee. But experts say the price hikes barely begin to make up for recent losses.

"The airline industry is devastated. It can't survive \$130-a-barrel oil," said industry analyst Ray Neidl at Calyon Securities in New York.

Many analysts think that unless oil prices fall back to about \$100 a barrel - where they were as recently as April - the industry will have to slash 20% of its routes, the equivalent of knocking two major airlines out of business.⁶⁴

The steep inflation in food prices, resulting from the increased fuel cost of long-distance distribution and from the conversion of land from food to ethanol production, has also spurred a large increase in home gardening.

⁶³ Steve Everly, "Gasoline Usage Heads Down," *Kansas City Star*, April 21, 2008 <<http://www.kansascity.com/105/story/585815.html>>. Judy Keen and Paul Overberg, "Gas prices rattle Americans," *USA Today*, May 8, 2008 <http://www.usatoday.com/money/industries/energy/2008-05-08-gasprices_N.htm>. Kevin Drum, "Oil Prices and Driving Habits," *Washington Monthly*, May 9, 2008 <http://www.washingtonmonthly.com/archives/individual/2008_05/013696.php>.

⁶⁴ Peter G. Gosselin, "\$130 Oil: Is That a Tipping Point?" *The Los Angeles Times*, May 24, 2008 <<http://www.latimes.com/business/la-fi-econ24-2008may24,0,6841046,full.story>>.

At Al's Garden Center in Portland, Ore., sales of vegetable plants this season have jumped an unprecedented 43% from a year earlier, and sales of fruit-producing trees and shrubs are up 17%. Sales of flower perennials, on the other hand, are down 16%. It's much the same story at Williams Nursery, Westfield, N.J., where total sales are down 4.6% even as herb and vegetable-plant sales have risen 16%. And in Austin, Texas, Great Outdoors reports sales of flowers slightly down, while sales of vegetables have risen 20% over last year....

Even before this year's food-price crunch, the vigor for veggies was already gaining momentum. An annual survey of more than 2,000 households by the National Gardening Association shows the average amount spent per household on flowers was flat in 2007 compared with a year earlier. But spending on vegetable plants rose 21% to \$58 per household last year, and spending on herbs gained 45% to \$32....

....Burpee's sales of vegetables and herbs are up about 40% this year, twice last year's growth rate. Tomatoes, summer squash, onions, cucumbers, peas and beans continue to be top sellers.⁶⁵

Many of these developments were anticipated by Warren Johnson during the energy crisis of the late 1970s, in a book called *Muddling Toward Frugality*.⁶⁶ Johnson argued that the long-term effect of rising energy prices would be to give a market advantage on shortened supply chains, small-scale production for smaller market areas, and diversified local economies. Although he jumped the gun by thirty years or so, his book is remarkably prescient in describing the likely effects of Peak Oil.

The Cost Principle and the Work-Week

One likely combined effect of reduced waste resulting from the cost principle, and from the abolition of privilege, is a drastic reduction in the work-week. As long ago as 1913, Kropotkin estimated the labor-time necessary to produce the actual food, clothing and housing that the average working family consumed at around 150 half-days' labor a year. The average worker's additional labor-time went either to waste or directly harmful production, or to supporting parasitic consumption.⁶⁷

Absent the unnecessary production that amounts to fixing Bastiat's broken windows, and other waste (including the deliberate choice of planned obsolescence over reparability by the state's industrial cartels), and absent the portion of commodity price that reflects embedded rents on "intellectual property" and other artificial property rights like artificially scarce land and capital, we could probably produce something like our current

⁶⁵ Anne Marie Chaker, "The Vegetable Patch Takes Root," *Wall Street Journal*, June 5, 2008 <http://online.wsj.com/article/SB121262319456246841.html?mod=pj_main_hs_coll>.

⁶⁶ Warren Johnson, *Muddling Toward Frugality: A Blueprint for Survival in the 1980s* (San Francisco: Sierra Club Books, 1978).

⁶⁷ Peter Kropotkin, *The Conquest of Bread* (New York: Vanguard Press, 1926), pp. 87-94.

standard of living working an average of two days a week. We're working the other three days to dig holes and fill them back in again, or to pay protection money so useless eaters won't use their artificial property rights to obstruct production.

Consider, first, the amount of total labor time that is devoted to waste production. Economists' calculation of the Gross Domestic Product is a textbook illustration of the "broken window fallacy." As the authors of *Natural Capitalism* point out, anything that involves an expenditure of money adds to the GDP.⁶⁸ Jonathan Rowe writes:

The GDP is simply a gross measure of market activity, of money changing hands. It makes no distinction whatsoever between the desirable and the undesirable, or costs and gain. On top of that, it looks only at the portion of reality that economists choose to acknowledge--the part involved in monetary transactions. The crucial economic functions performed in the household and volunteer sectors go entirely unreckoned. As a result the GDP not only masks the breakdown of the social structure and the natural habitats upon which the economy--and life itself--ultimately depend; worse, it portrays such breakdown as economic gain.⁶⁹

Or as Scott Burns puts it, "The value of a friend's services on his own car is excluded from GNP. But the cost of his accident, ambulance ride, and hospital stay is not."⁷⁰

Everything that entails the expenditure of money adds to the GDP, even if most of the cost is waste that adds nothing to the actual production of use-value. A pileup on the expressway that totals out a dozen cars and results in several funerals or several people spending weeks on life support means millions of dollars added to the GDP. When you pay three times as much to buy food grown in another country with subsidized irrigation water and trucked to you on subsidized highways, as it would cost to buy food of identical quality grown by a local farmer and distributed in bulk without a brand-name markup, it adds three times as much to the GDP--even though you're just having to work three times as long to obtain identical (or inferior) use-values.

There is a small but significant body of literature on the percentage of the national economy made up of waste. For example, Edward Wolff sees the economic surplus being absorbed, in addition to capital accumulation, by surplus consumption and unproductive activity. The former is "the consumption of use values by the surplus class," and the second "the absorption of part of the product in activities that produce no use values themselves but instead serve to maintain an existing set of entitlements to the total product." Unproductive activities "use labor power but produce no directly usable output (use value)."

Instead, they serve to maintain and reproduce an existing set of entitlements to the social

⁶⁸ *Natural Capitalism*, pp. 59-60.

⁶⁹ T. Halstead, Jonathan Rowe, and C. Cobb, "If the GDP is Up, Why is America Down?," *The Atlantic Monthly* 276(4):59-78, Oct. 1995, in *Natural Capitalism*, p. 60.

⁷⁰ Scott Burns, *The Household Economy: Its Shape, Origins, & Future* (Boston: The Beacon Press, 1975), pp. 61-62.

product.⁷¹

Wolff's work is almost completely unusable because of his extremely arbitrary schema for classifying "productive" and "unproductive" activity. For example, he assigns the whole economy to those respective categories, piece by piece, almost entirely by broad sectors or industries. In so doing he neglects, almost completely, what is arguably the single most quantitatively significant form of waste in the modern corporate economy: the suboptimal allocation of resources or mixture of inputs within an industry. Many production inputs are necessary, in some quantity, for production; but they are used inefficiently because their consumption is subsidized by the state. In Wolff's schema, if a manufacturing industry produces use value, the entire industry is categorized as "productive," no matter how wasteful of inputs. Questions of planned obsolescence, and the like, slip completely between the cracks of Wolff's sector-by-sector evaluation.

Much more useful, in my opinion, is Lloyd Dumas' study, already cited earlier in this chapter, *The Overburdened Economy*. We already saw Dumas' claim that much of GDP consists of the moral equivalent of digging holes and filling them back in again, products and activities which have no actual use value, but are assigned a monetary value.

Ordinarily, the existence of a money price at which a good or service is actually purchased is by itself taken as proof that the good or service has economic value. Yet, if we define economic value functionally, it is clear that this is not true. The mere fact of a money price in no way establishes the existence, let alone the magnitude, of economic value.... Empirical constructs like gross national product are subject to this confusion of money value with economic value, and therefore require caution in their use--caution that has often been neglected.⁷²

As I have argued, much of the GDP consists of the cost of replacing Bastiat's "broken windows." If these broken window costs, these unproductive uses of labor, were eliminated from the economy, the actual use-value consumed by the average worker could probably be produced in substantially fewer hours than he currently works. Such proposals frequently meet with the objection that something called "the economy" would be hurt, or that there wouldn't be enough "jobs." The argument, as stated by Dumas: "A society that does not generate waste in the form of planned obsolescence, or neutral or distractive activities, cannot, it is commonly argued, generate sufficient paid work opportunities to keep the labor force fully employed."⁷³ Or as stated by George Meany, who complained that labor-saving technologies were "rapidly becoming a curse to this society... in a mad rush to produce more and more with less and less labor, and without feeling [as to] what it may mean to the economy as a whole."⁷⁴

⁷¹ Edward N. Wolff, *Growth, Accumulation, and Unproductive Activity* (Cambridge, London, New York, New Rochelle, Melbourne, Sydney: Cambridge University Press, 1987), pp. 3-4.

⁷² Dumas, pp. 43-44.

⁷³ Ibid, p. 75.

⁷⁴ Jeremy Rifkin, *The Future of Work: The Decline of the Global Labor Force and the Dawn of the Post-Market Era* (New York: G. P. Putnam's Sons, 1995), pp. 84-85.

Of course this is nonsense. Labor-saving technology is not a curse when the subsistence farmer manages to feed himself with less work. It becomes a curse only when the link between work and consumption is broken, when either work or its product becomes maldistributed. Dumas showed why Meany's complaint was nonsense.⁷⁵

The key here lies in the word "sufficient." To be sufficient the paid work opportunities need only supply enough income to satisfy the material needs and wants of the population, given the availability of goods and services for which no income is necessary. In the hypothetical purely wasteless economy, that means the workers must earn only enough income to supply them with the nondurable goods and services for which they must pay, plus any required or desired increase in their stock of durable goods. But once they have obtained access to a durable good, whether by purchase, gift, or inheritance, they need only enough income to cover the costs of its operation and maintenance.... So although there is less paid work *available* because durable goods are not built to become artificially obsolete or to fall apart, for exactly the same reason there is also less paid work *needed* by workers in order to achieve a given material standard of living. Accordingly, the permanence of durable goods may reduce the volume of paid activity, but it does not reduce the material well-being of the work force.⁷⁶

The only point of a job is consumption, and what matters is the ratio of effort to consumption. The problem is that the average worker must perform the equivalent of twenty hours digging holes and filling them in, in addition to twenty hours of productive labor, to pay for the actual twenty hours' worth of use-value he consumes. And the price of that twenty hours' worth of use value has embedded in it the cost of another twenty hours of unproductive labor. These things result, as we saw in Chapter Eleven, from the divorce of effort from consumption, and the maldistribution of claims on his labor-product.

Dumas' test for what he calls a "contributive" activity (i.e., contributive to use value) is twofold:

(1) Is it part of a process that results in the production of a good or service that has inherent economic value? and (2) Does it perform a function necessary to the efficient operation of that process? A negative answer to either question disqualifies the activity from being considered contributive.

This second criterion is a major advance on the schema of Wolff, who (as we saw) completely ignores the question of how efficiently resources are used within the production process.

The second test is necessary because even if the process results in an addition to the standard of living, redundant or unnecessary activities within that process do not contribute

⁷⁵ Dumas, pp. 46-47, 70-76.

⁷⁶ Ibid., pp. 75-76.

to that addition.

Activities which pass the first test but fail the second, Dumas calls "neutral." And those which fail both tests are "distractive."⁷⁷ Both are non-contributive.

Freeing resources from neutral activities is simply a matter of an efficiency adjustment within an economically focuses process; freeing resources from a distractive process requires terminating the process itself and rechanneling all resources involved to contributive activities.⁷⁸

"The preeminent contemporary example of neutral activity," Dumas writes, "is... the untoward expansion of administration relative to production." Although it is widely justified in terms of the alleged increase of productive efficiency which results from intensive use of management, the increased allocation of resources to administration has in fact not resulted in increased production.⁷⁹

Another form of waste, one that Dumas pays little attention to, is the forced consumption resulting from Ivan Illich's "radical monopolies," which we discussed in Chapter Four. This consists of expenditures that are not actually necessary for a given standard of living, but which have been rendered artificially necessary by the effect of state policies which promote the crowding out of less expensive by more expensive ways of doing things. For example, someone who lives in a walkable city like Florence, within convenient distance of where he shops and works, and has access to convenient public transport for visiting other parts of the city, is likely to view a car as a luxury. The typical American suburbanite, on the other hand, has been deprived of all alternatives to car ownership by subsidies to sprawl and the car culture. Having no choice, he must treat the car as a necessity. The GDP is inflated by whatever amount he must spend on periodically buying a car, keeping it insured and in working order, and putting gas in the tank. That portion of the GDP is, essentially, the cost of a window broken by the state. And it's a huge part of GDP. According to Bill McKibben, in compact, mixed-use communities that emphasize walkability, bike-friendliness and public transit, transportation costs amount to only 4 or 5% of local economic output. In American freeway-centered communities, it's more like 17%.⁸⁰

The cumulative waste described by another writer, Douglas Dowd, that falls essentially into Dumas' neutral or distractive activities, is immense.⁸¹ It includes, of course, the entire military sector of the economy. But the waste in the military sector is probably dwarfed by the waste in the peacetime economy. This is especially true of the

⁷⁷ Ibid., p. 53.

⁷⁸ Ibid., p. 54.

⁷⁹ Ibid., p. 57.

⁸⁰ McKibben, *Deep Economy*, p. 154.

⁸¹ He estimates the U.S. GDP would have been 49% higher in 1980 without the enumerated forms of waste. Douglas Dowd, *The Waste of Nations: Dysfunction in the World Economy* (Boulder and London: Westview Press, 1989), p. 65.

wastes associated with push distribution: planned obsolescence, excessive marketing costs, brand-name markups, etc.⁸² Coupled with the unnecessary inflation of administrative expenses, described earlier by Dumas, it probably outweighs the material production cost of most of what we buy.

Dowd refers to toothpaste, ninety percent of whose price results from marketing costs. A still weightier example, based on General Motors' figures from 1939, indicates that some \$150 of a Chevy's \$950 market price was actual production cost.

The rest was for advertising, distribution, and profits (and the production costs of course included the trivial appearance changes that, it has been estimated, amounted to at least one-third of production costs over time). To this it may be added that between 1928 and 1939, years encompassing the worst depression in history, profits for GM averaged a 35 percent return to net worth. It should be noted that in 1939 the sales effort industry was only just beginning to master the art of waste.

This is true, he says, for almost all consumer goods.⁸³ Incidentally, Dowd was forced to go back to a 1940 FTC study on the automobile industry for the most recent available data, because the auto industry has been so secretive about its actual production costs.

Shoddy product design is another major source of waste. The central villain is what engineers call the "gold-plated turd": a product that, rather than being simply and elegantly designed to perform its primary task as efficiently and reliably as possible, is laden with extra features and options that reduce ease of use and lead to frequent breakdowns and require ongoing expenses to maintain. Victor Papanek, an industrial designer who has made a career of denouncing gold-plated turds, gives the example of a cheese grater which works only right-handed and, after several months use, wears out to the point that its own plastic coating is grated into the food. By way of comparison, a cheaper, simpler and more efficient model works both right- and left-handed, and will last virtually forever.⁸⁴

Output restriction should also count as a form of waste. The resources devoted to excess industrial capacity, thanks to state-subsidized overaccumulation, inflate commodity prices. The standard practice, among oligopoly industries, of running at 75-80% of capacity and passing the cost of idle capacity on to the consumer, adds greatly to the price.⁸⁵ In farming, holding land out of use for price support or "conservation" subsidies is a lucrative real estate investment, which simultaneously adds to the social cost (albeit concealed in taxes) of corporate farm produce, and makes land artificially scarce and expensive for the small producer.

⁸² Ibid., pp. 64-65.

⁸³ Ibid., pp. 65-66.

⁸⁴ Langdon Winner, *The Whale and the Reactor: A Search for Limits in an Age of High Technology* (Chicago and London: University of Chicago Press, 1986), p. 77.

⁸⁵ Dowd, pp. 67-68.

Planned obsolescence, as we shall see in Chapter Fourteen, often severely shortens product lifetime with no appreciable reduction in product cost. Consider, for example, product designs that are deliberately designed to thwart repair and encourage replacement, often relying on "intellectual property" to restrict access to replacement parts. Specifically, consider the example in Chapter Fourteen of the iPhone, which is deliberately designed to impede an operation as simple as unscrewing the back panel to free up a stuck button, so that the owner has to pay for a replacement phone instead.

Dowd also refers to the lower productivity of labor and higher unit costs resulting from low morale and other incentive problems in the standard capitalist enterprise,⁸⁶ which we discussed heavily in Part Three (in contrast, see the material on increased productivity of labor in Chapter Fifteen). For example, the worker-owned plywood co-ops in the Pacific Northwest typically have a quarter the supervisory personnel of a capitalist-owned plywood factory, because of the completely different structure of incentives in a worker-owned and -managed firm. Dowd compares the 10.8% of the U.S. labor force in managerial and clerical positions in 1980, compared to 3% in Germany and 4.4% in Japan (that ten percent in 1980 was comparatively modest compared to the inflated level it has swollen to since then, as we saw from David M. Gordon's figures quoted in Chapter Eight).

Unfortunately, Dowd telescopes internal waste in the production process together with other forms of waste, in a way that obscures a proper comparison. For example, he fails to separate the necessary costs of actually transporting a finished good from the point of production to the point of consumption from the rest of the general category of marketing and distribution. (Transportation can also be a form of waste, obviously, as with the subsidized replacement of economical passenger freight railroads by trucking and airline industries⁸⁷--but it's still a separate issue from inflated marketing costs.) He also includes the GM's astronomical oligopoly profit rate of 35%, which Wolff would call unproductive consumption, along with the wasted material inputs in the actual production process.

Of course, the category of unproductive consumption by holders of artificial property right is important in its own right: whether it be GM's 35% profit, the 20-25% oligopoly price markup that the Nader Group described in American industry, or the majority of product value that Peters celebrated as resulting from "intellect" (i.e., rents on so-called "intellectual property").

One point in Wolff's favor is his attention to such unproductive consumption by privileged classes. Although this obviously falls within Boulding's category of implicit transfer ("a redistribution of income or command of the product from those who produce

⁸⁶ Ibid., p. 70.

⁸⁷ He deals with this in pp. 78-80.

it to those who do not"), Dumas pays little attention to it. Boulding himself mentions the question of whether interest and rent, beyond a certain point, fall into Dumas' "neutral" category, and then dismisses it as a subject for further research. The amount of commodity price which reflects embedded rents on so-called "intellectual property" doesn't warrant even this much of a mention.

This is, in my opinion, a grave shortcoming on Dumas' part. Consider the amount of the average worker's total labor that is expended not only to pay for the above-mentioned embedded costs of intellectual property and for the oligopoly markup, but to pay artificial scarcity rents to owners of land and capital. The cumulative effect of eliminating all such forms of privilege would likely equal that of eliminating subsidized waste in the production process. If, as seems plausible as a rough approximation, waste production and rents on intangible property each result in what amounts to a 100% markup, then their cumulative effect is to quadruple the number of work hours actually necessary to produce our current levels of consumption. Three quarters of our labor goes either to waste or to tribute.

These things have a lot to do with the fact, observed by Ivan Illich, that countries with (say) a quarter of American per capita GDP usually seem to have a far better quality of life than that statistic would imply. The quality of life in Europe, for example, hardly seems to be two thirds or less that in the U.S., as per capita GDP would seem to imply.

...European workers are every bit as productive as ours; both German and French workers, for instance, produce more per hour than American workers. So why do Americans make 29 percent more money than Europeans? Because we work longer hours. *Much* longer hours--Americans average 25.1 working hours per person per week, but the Germans average 18.6; the average American works 46 weeks a year, while the French average is 40. Europeans work to live, not the reverse; they spend more time with their families, which may have something to do with why their divorce rates are much lower....

For Americans caught up in the orthodoxy of getting and spending, that may not seem like such a bargain. A writer based in Oslo, for instance, recently wrote a piece for the *New York Times* with the lovely title "We're Rich, You're Not. End of Story." He pointed out that while Americans had \$32,900 per person to devote to "private consumption," the European averages ranged between \$13,850 and \$23,500. That is indeed a big difference; the Europeans were definitely "poorer" than we, and the writer delighted in listing the ways. "They hang on to old appliances and furniture that we would throw out," for instance. And this: "One image in particular sticks in my mind. In a Norwegian language class my teacher illustrated the meaning of the word *matpakke*--'packed lunch'--by reaching into her backpack and pulling out a hero sandwich wrapped in wax paper. It was her lunch. She held it up for all to see. Yes, teachers are underpaid everywhere. But in Norway the *matpaake* is ubiquitous, from classroom to boardroom. In New York, an office worker might pop out at lunchtime to a deli.... In Norway she will sit at her desk with a sandwich from home."⁸⁸

⁸⁸ Bill McKibben, *Deep Economy*, pp. 223-224. The obnoxious writer he cites is Bruce Bawer, "We're Rich, You're Not, End of Story," *New York Times Magazine*, April 17, 2005.

Well, considering that the teacher could easily duplicate the quality of a deli sandwich at home without a 400% markup, and could relax in peace and quiet rather than having to rush out and back and probably deal with a large, unpleasant lunchtime crowd while she was out, the difference might just be that she wasn't *stupid*. I never spend money on brand name markups when generic goods are equal in quality, because I never spend money on *anything* without comparing the enjoyment I expect to receive to the unpleasantness of working an extra number of hours to pay for it. I see plenty of coworkers who work twenty hours of overtime a week, just so they can afford never to have a car more than two years old. I see people who live in dread of not "getting their hours in," because they've got to work every possible hour to make the interest-only payments on a house twice the size of the average house a generation ago. I see people who never have time to enjoy a peaceful moment, shopping online for new consumer electronic toys so they can throw out the perfectly functional appliances Bruce Bawer remarked on. And it's hard not to draw the conclusion that they're stupid: they've been *trained* to be stupid, since childhood, by the relentless propaganda of a push-distribution society. "Ending is better than mending. The more stitches, the less riches." And as we saw in Chapter One, this mass consumer propaganda was first engineered in the 1920s to overcome the average person's natural tendency to work only until he had *enough*, and then to choose leisure over more consumption. We've adjusted our lifestyles to make money for other people, which is the definition of stupidity.

An uncharitable person might remark that working sixty hour weeks in order to be able to throw out perfectly functional appliances, or to avoid the ignominy of bringing a sack lunch to work, or to buy expensive consumer electronics that one has no time to use, or to spend every spare waking moment "multitasking" on a cell phone or blackberry rather than being able to think, reflects an incredibly stupid sense of priorities. Likewise the choice to live in a McMansion, on interest-only terms, that will never be paid for, and always a couple of paychecks away from homelessness, rather than to buy a house half the size that can be paid off in ten or fifteen years, displays a monumental lack of judgment. And the portion of per capita GDP produced by working an extra ten hours a week to earn the portion of per capita GDP that goes to car payments, and gasoline, and insurance, rather than being able to walk or bike to work and shopping in a relaxed manner, seems like a remarkably poor deal. Working sixty hour weeks and being in hock up to one's eyeballs, in order to be able afford fancy toys one doesn't even enjoy and support a lifestyle aimed mainly at impressing equally clueless idiots, sounds an awful lot like the kind of "steep time preference" and "short planning horizons" that right-wing moral scolds attribute to the underclass. The American lifestyle Bawer celebrates is almost a parody of a drunken sailor's habits.

C. The Cost Principle and Local Autonomy

Another positive effect of the cost principle, and the radical decentralization that would likely result from it, is a healthier relationship between industry and the local

community. H. Thomas Johnson writes:

If no firm had a financial incentive to grow beyond the limits of its bioregion, then any firm could focus its activities on a specific place where it knows its customers, employees, and suppliers face to face and it draws on sources of energy and materials found literally in its own backyard. By drawing the decisions of customers and owners of capital closer to the consequences for workers and their communities, those conditions would increase the visibility of, and increase pressure to eliminate, the externalities that plague today's widely-dispersed, global economy. A company that inhabits the region where it operates is more likely than one of today's global giants to see externalities (what Toyota might call an abnormality) when and where they occur, and have an incentive to mitigate the consequences as quickly as possible.

Having more companies operate at smaller scale and in local regions has other beneficial consequences for achieving true sustainability in the human economy. One likely consequence of greater localization of economic activity is diminished inequality in the distribution of rewards and externalities. Extreme inequality of wealth and income such as the American economy has experienced in recent decades gives those individuals at the top of the heap increased power to act in ways that are contrary to the interest of sustainability for all. Another likely consequence of increased localization and smaller scale operations is less need for large amounts, or any amounts, of funds raised by sale of equities as opposed to funds generated internally from current earnings. With less emphasis on equity capital there presumably would be less interest in financial markets and stock trading. It is not impossible to imagine a locally oriented economic system where no publicly traded corporations exist to flaunt the cause of sustainability in the interest of maximizing shareholder wealth and top executive compensation packages.

Finally, with closer proximity of actions and consequences in a locally oriented economy there would hopefully be less need for accounting data to define and assess results and responsibilities. Just as the presence of those conditions in Toyota's operations virtually eliminated the use of production and financial controls to direct and assess operations, so might the business community and the larger public recognize the waste of complex and extensive accounting controls in a locally-oriented, "small is beautiful" economy. Increased proximity of actions and consequences might even reduce the need for taxes, subsidies, and regulations enforced from afar to encourage sustainable behavior. Results would now be visible real time in the local arena as part of local processes. As in Toyota, all the information needed would be contained in the work and the work would be the primary source of information about results and consequences.⁸⁹

Starting from where we are, a trend toward economic decentralization and cooperative ownership would make communities more resilient and less vulnerable to corporate economic blackmail. One of the perceived weak points of decentralism, as stated by skeptics, is the ability of national corporations to play communities against each other, when they all have separate and uncoordinated policies. Angelica Oung, for

⁸⁹ H. Thomas Johnson, "Sustainability and Lean Operations," *Cost Management*, March/April 2006, pp. 44-45.

example:

..[W]hat's good for towns on an individual level can be harmful if everybody started doing it. For instance, if my town gives Walmart a bunch of tax breaks and get them to build a supercenter in my town, dollars starts pouring into my locality from all over. The "corrupt" town can indeed outcompete a non-corrupt town.

My area starts doing really well. However, the next town over now offers all those superstores even better deals. Now I'm sweating. What other sweetheart deals can I offer to get that business?

Eventually, every town is a loser.

Same with... public parking lots.... I'm sure they make sense for the local municipality thinking from a purely local point of view. Bethesda, alone, cannot change car culture in America if it does not build that public lot. But it will lose out on \$\$\$ that would be spent at that Barnes and Noble to a town that has adequate parking if it does not.⁹⁰

If the typical manufacturing firm were a factory of a few dozen workers (or fewer) serving a local market, rather than a large oligopoly firm serving a national market and pushing a product marketed around national brand identification, it would be *a lot* less feasible to pick up and move to a different part of the U.S. (let alone overseas).

And that would be even more true, if local economies were diversified on the Emilia-Romagna model, with much higher levels of self-employment and cooperative ownership. If there were many small and medium-sized employers in manufacturing, instead of one big corporation colonizing a locality, people would be a lot more prone to say "good riddance!"

On the other hand, an end to subsidized superhighways and airports would drastically reduce the total volume of freight in the national economy, and increase unit shipping costs. So the current model of economic colonization--building a large factory in a single location and trucking the output around a large market area--would be far less feasible. Factories would be much more likely to be built to serve the market where they were located. So maybe the answer to the problems of decentralism is more decentralism.

⁹⁰ Angelica Oung, "Local Externalities, or why decentralized isn't always better," *The Art of the Possible*, April 30, 2008 <<http://www.theartofthepossible.net/2008/04/30/local-externalities-or-why-decentralized-isnt-always-better/>>.