Marx says that revolutions are the locomotives of world history. But the situation may be quite different. Perhaps revolutions are not the train ride, but the human race grabbing for the emergency brake.

-- Walter Benjamin

The subtitle of Joel Kovel's The Enemy of Nature (originally published in 2002, revised edition 2007) states his thesis bluntly: The End of Capitalism or the End of the World? Kovel thinks we need a revolution--although he is fully cognizant as to how remote that prospect seems.

Growing numbers of people are beginning to realize that capitalism is the uncontrollable force driving our ecological crisis, only to become frozen in their tracks by the awesome implications of this insight.¹

Paul Hawken, Amory Lovins and Hunter Lovins also think we need a revolution, but of a different sort than the one envisaged by Kovel. Their book, Natural Capitalism (published in 1999), is subtitled Creating the Next Industrial Revolution. Then-President Clinton is reported to have called it one of the five most important books in the world today.
Hawken and the Lovins' agree with Kovel that the current model of capitalism is problematic. "Capitalism, as practiced, is a financially profitable, non-sustainable aberration in human development." But they do not see the problem as residing in capitalism itself. They distinguish among four kinds of capital, all necessary for production: human capital, financial capital, manufactured capital and natural capital. The problem with the current form of capitalism, they argue, is its radical mispricing of these factors. Current market prices woefully undervalue--and often do not value at all--the fourth factor: the natural resources and ecological systems "that make life possible and worth living on this planet."

All economists, no matter whether conservative, liberal or Left, recognize that market transactions can involve "externalities"--costs (or benefits) that are not paid for by the transacting parties. All agree that there is a role for governments to play in rectifying these defects. The standard remedies tend to be taxation (for negative externalities) and subsidies (for positive externalities). More recently, "cap and trade" schemes for carbon emissions have been added to the list.

Hawken and the Lovins' argue that these remedies--properly applied--can work. The first step, they say, is to eliminate the *perverse* incentives now in place. They document the massive subsidies that governments currently provide for ecologically destructive behavior, e.g. highway construction and repair, which encourages suburban sprawl and the shift away from more efficient modes of transportation, agricultural subsidies that encourage soil degradation and wasteful use of water, as well as subsidies to mining, oil, fishing and forest industries.

Second step: impose resource and pollution taxes so as to reflect the true costs of "natural capital." Sweeten the pie by phasing out all taxes on labor, which increase unemployment, and income taxes as well. The point is to level the playing field so that more sustainable energy
technologies and more energy efficient processes can compete fairly with the destructive practices of "industrial capitalism." We might even want to go further, and subsidize--at least initially--the technologies that reduce the negative environmental impact of our production and consumption choices.

*Natural Capitalism* is full of examples of the shocking waste in our current production and consumption and of the existing technologies and procedures that can reduce our impact on the environment to a small fraction of what it is now. Many of these changes are already underway. Many more will follow if appropriate government policies are adopted. Hawken and the Lovins' envisage a bright future:

Imagine for a moment a world where cities have become peaceful and serene because cars and buses are whisper quiet, vehicles exhaust only water vapor, and parks and greenways have replaced unneeded urban freeways. OPEC has ceased to function because the price of oil has fallen to five dollars a barrel, but there are few buyers for it because cheaper and better ways now exist to get the services people once turned to oil to provide. Living standards for all people have dramatically improved, particularly for the poor and those in developing countries. Involuntary unemployment no longer exists, and income taxes have been largely eliminated. Houses, even low-income housing units, can pay part of their mortgage costs by the energy they *produce*. . . 

Such a future will come about, they argue, if we harness the creative energy of capitalism and let the markets work their magic.
Let us examine these two contrasting perspectives. The first two-thirds of this paper will be concerned with the question of capitalism as a sustainable model for a developed capitalist country such as the United States. This is the context within which both Kovel and the Hawken-Lovins' offer their analyses. I will give special attention to a structural alternative to capitalism. I will conclude with some reflections on the implications of my analysis for China.

**Kovel and HLL: Similarities and Differences**

Consider the ethical commitments that underlie their respective analyses. Kovel cites Marx directly and with full approval:

> From the standpoint of a higher form of society the private ownership of the globe by single individuals will appear quite as absurd as private ownership of one man by another. Even a whole society, a nation, or even all simultaneously existing societies taken together, are not the owners of the globe. They are only possessors, its usufructuaries, and like *boni patres familias*, they must hand it down to succeeding generations in an improved condition.⁵

Hawken and the Lovins' might not agree that private ownership is absurd, but they would certainly embrace the ethical clause: We "are only possessors [of the earth], its usufructuaries, and like good heads of households, [we] must hand it down to succeeding generations in an improved condition." So there is no real disagreement here about ethics. The differences lie elsewhere.
In essence the fundamental difference between the "ecosocialism" of Kovel and the "natural capitalism" of Hawken-Lovins' is this: Kovel is convinced that "grow or die" is an imperative of capitalism that renders "sustainable capitalism" impossible. Hawken and the Lovins' do not confront this argument directly, but their conclusion requires one of two premises: either a) capitalism is compatible with a steady-state, non-growing economy or b) an economy can grow indefinitely without consuming more energy and natural resources than it can sustainably reproduce.

Let us examine this

**Capitalism: Grow or Die?**

Anti-capitalist ecologists always say this: a capitalist economy must grow--or die. In Kovel's words, "capital must expand without end in order to exist." But is this true? It would seem not to be. Individual small businesses sometimes survive for long periods of time. Marx's prediction that the "petty bourgeois" sector would disappear has turned out not to be true. (The tendency toward monopoly/oligopoly, which Marx correctly identified, has been offset by the continual rise of new entrepreneurial businesses.)

Capitalism itself has survived prolonged depressions--the Great Depression of 1929 lasted a decade. Periods of stagnation have been even more common, for example, Japan throughout the 1990s. To be sure, capitalism incentivizes growth, but it is not at all clear that thwarted growth leads to death. There are many counterexamples.

It is not true either that the various ecological crises we are facing will bring about "the end of the world." Consider the projections of the Stern Review, the recently released report commissioned by the British Government. If nothing is done, we risk "major disruption to
economic and social activity, later in this century and the next, on a scale similar to those
associated with the great wars and economic depression of the first half of the 20th century."\(^7\)

This is serious. Some sixty million people died in World War Two. The Stern Review
estimates as many as 200 million people could be permanently displaced by rising sea level and
drought. But this is not "the end of the world." Even if the effects are far worse, resulting in
billions of deaths--a highly unlikely scenario--there would still be lots of us left. If three-quarters
of the present population perished, that would still leave us with 1.6 billion people--the
population of the planet in 1900.

I say this not to minimize the potentially horrific impact of relentless environmental
destruction, but to caution against exaggeration. We are not talking about thermonuclear war--
which \textit{could have} extinguished us as a species. (It still might.) And we shouldn't lose sight of
the fact that millions of people on the planet right now, caught up in savage civil wars or living
beneath U.S. bombers (which dropped some 100,000 lbs. of explosives on a Baghdad
neighborhood during one ten-day period last January--the amount the fascists used to level the
Basque town of Guernica during the Spanish Civil War), are faced with conditions more terrible
than anyone here is likely to face in his or her lifetime due to environmental degradation.

Nevertheless, from an ecological point of view there would seem to be something \textit{crazy}
about capitalism. An ecological worldview tends to emphasize harmony, sustainability,
moderation--rather like that of the ancient Greeks, for whom a constant striving for \textit{more} was
regarded as a mark of an unbalanced, deranged soul. Yet every capitalist enterprise is motivated
to grow, and to grow without limit. For reasons of greed and fear. Under conditions of constant
or increasing returns to scale, expanding production brings increased profits, which accrue to a
firm's owners. The fear factor is at least as important. Failure to take the steps that will, if
successful, "grow the company," puts the company at serious risk. Big fish tend to eat the little fish. Capitalist market competition is cut-throat competition.

There is a deeper structural issue that we must consider. It may well be the case that all capitalist firms want to grow--but this does not imply that the economy as a whole needs to grow. (If the smaller fish keep reproducing, why can't the system stabilize? The small fish may want to grow to be big fish, but most are eaten, so few of them do. The big fish may want to get bigger, but food supplies are limited, so few of them do.) The root problem with capitalism is not that individual firms are motivated to grow, but that the economy as a whole must grow--not to survive, but to remain healthy. (As I have noted, there have been significant periods in which capitalist economies have failed to grow but did not collapse. However, none of those periods--recessions, depressions, stagnation--can be regarded as "healthy.").

Why should it be the case that a capitalist economy must grow to be healthy? The answer to this question is rather peculiar. A capitalist economy must grow to be healthy because capitalism relies on private investors for its investment funds. (Notice, this is a quite different factor than the greed/fear that motivates individual firms to expand.) These investors are free to invest or not as they see fit. But this makes economic health dependent on "investor confidence," on what John Maynard Keynes called "the animal spirits" of the investors. If investors do not foresee a healthy return on their investments, commensurate with the risks they are taking, then they won't invest. But if they don't invest, their pessimism becomes a self-fulfilling prophesy. Lack of investment translates into layoffs--first in the construction industry, machine tools industries and the many others dependent on orders for capital goods, and then, since layoffs lead to a decline in consumer-goods consumption, layoffs in other sectors as well. Aggregate demand drops further; the economy slides toward recession.
An economy in recession is not just bad for capitalist investors. It is bad for almost everyone. Unemployment rises, which adds stress to almost all workers, even those who retain their jobs. Government revenues fall, adding pressure to cut both government employment and government services. Indeed, public funds for environmental programs are jeopardized—as mainstream economists are quick to point out, impatient as they are with "anti-growth" ecologists. Growth is necessary, they insist, to give us the means to clean up the mess we have made.

So we see: a healthy capitalism requires a steady expansion of consumption. Sales must be kept up, which means that a healthy capitalism requires what would doubtless strike a visitor from another planet (or from a pre-capitalist society or from an ecologically-sustainable society of the future) as exceedingly strange—a massive, privately-financed effort to persuade people to consume what they might otherwise find unnecessary. John Kenneth Galbraith's description, articulated more than forty years ago, remains apt:

The control or management of demand is, in fact, a vast and rapidly growing industry in itself. It embraces a huge network of communications, a great array of merchandising and selling organizations, nearly the entire advertising industry, numerous ancillary research, training and other related services and much more. In everyday parlance this great machine, and the demanding and varied talents that it employs, are said to be engaged in selling goods. In less ambiguous language, it means that it is engaged in the management of those who buy goods.
Government also has a key role to play. Governments must be prepared to go into debt to stimulate the economy when an economy slows down. "Fiscal responsibility" is abandoned, no matter how conservative the government, when people stop buying. The stimulus packages put in place recently by the Bush administration, strongly backed by a Democratic congress, reminds us all how vitally a capitalist economy depends on what so many environmentalists and other social critics deride as "consumerism."

The problem is not simply "growth." A healthy capitalism depends, not simply on ever-increasing consumption, but on a steady rate of growth. When the growth rate declines, investors pull back. But a steady rate of growth, so essential to healthy capitalism, implies exponential growth, and exponential growth, to anyone with mathematical sensibilities, is deeply troubling. If an economy grows 3%/year--the U. S. average during the 20th century--consumption doubles every twenty-four years--which translates into a 16-fold increase in consumption over the course of a century. A 10%/year rate of growth, such as that achieved by China for several decades now, implies a doubling of economic output every seven years. If sustained over the course of a century, China's 10%/year grow rate would involve increasing output $2^{14} = 16,384$ -fold. (The implications of exponential growth are often difficult for the non-mathematical mind to grasp. The United States had an average annual growth rate of 3% over the course of the 20th century, which means that output doubled every 24 years, leading to a $2^4 = 16$-fold increase over the course of the century. If the United States had maintained China's rate of growth, we would be producing, not sixteen times more at the end of the century, but sixteen thousand times more ($2^{14} = 16,392$) than it produced in 2000. The seemingly modest difference between a 3% growth rate and a 10% rate translates to an almost incomprehensible output difference when compounded over a century.)
Needless to say, exponential growth tends to stress the environment. Even a much lower growth rate, say the 1.2%/year that the much-discussed Stern Review assumes for the global economy, entails a doubling of global consumption ever sixty years. As Kenneth Boulding (himself an economist) has noted, "Only a madman or an economist thinks exponential growth can go on forever in a finite world."\(^\text{10}\)

**Objection**

There is an important rejoinder to be made to the argument that endless growth cannot continue. Growth *need not* add to resource depletion or pollution. Gross domestic product, the base figure upon which growth rates are calculated, is a quantitative figure that doesn't pretend to correlate with general well-being. An oil spill that puts lots of people to work cleaning it up enhances GDP; when married couples eat out more often, no longer having time to cook at home, GDP goes up. By the same logic, if unemployed people are put to work planting trees, GDP goes up. If there is a shift from capital-intensive factory farming to labor-intensive organic farming in such a way that the market value of the latter exceeds the market value of the former, GDP goes up.

Consider the effect of a green tax--say raising the gasoline tax from its current 40 cents/gallon in the U.S. to $4/gallon, bringing the pump price up to $8/gallon. In and of itself, this need not affect overall spending (i.e. GDP) at all. People would presumably drive less--which is the point of the tax--but their overall expenditures on gasoline would still likely go up, since few people would drive only half as much as they do now, in response to a doubling of gasoline prices. This means they could consume fewer other things, but their *total* expenditures would not be affected. Of course their cutback in consumption would trigger layoffs in some
industries--and hence a decrease in overall demand. But the government could counter that effect by using the gasoline-tax revenues in such a way as to compensate. If they are used to employ people engage in environmentally constructive work (either directly or by awarding contracts to private businesses engaged in environment-enhancing endeavors), then overall demand will not be impaired--and the society will be better off.

Consider a variation on this model--the one suggested by Hawken and the Lovins' and heartily endorsed by (conservative) economist, Gregory Mankiw (University of Chicago, head of George W. Bush's Council of Economic Advisors for a number of years). Instead of the government involving itself directly in employing people to restore the environment, suppose it just cuts income taxes instead--by precisely the amount that it would garner from the gasoline tax. Here is Mankiw's assessment:

Cutting income taxes while increasing gasoline taxes would lead to more rapid economic growth, less traffic congestion, safer roads and reduced risk of global warming--all without jeopardizing long-term fiscal solvency. This may be the closest thing to a free lunch that economics has to offer.¹¹

Reply to the Objection

How should we evaluate this rejoinder? Notice the assumption tucked away in the Mankiw endorsement of a heavy gasoline tax. It is assumed that the negative effect on the environment of "more rapid economic growth" will be more than offset by the decrease in carbon emissions resulting in the gasoline tax. We can have growth, he assumes, but our increased consumption will put less stress on the environment than our current consumption.
Is he wrong? I can't say for certain that he is. No one can. It is possible that new, green technologies will be discovered that will allow ever increasing, sufficiently dematerialized, consumption to expand indefinitely into the future without wreaking ecological havoc. But observe: we are no longer talking economic science; now we are talking about faith—the economists' faith that exponential growth can go on forever in a finite world.

Is this a rational faith? It is certainly irrational to think that exponential growth can go on forever. But maybe the investor class can adjust to a slowing rate of growth. Maybe they can be induced to set aside individual, short-term self-interest, and keep reinvesting, even when prospects look dim. And maybe these investments will result in the technological breakthroughs required for ecological sustainability.

But here is something to consider: Even if we can keep increasing consumption well into the future, we can be almost certain it won't make us happier—at least not those of us who are doing most of the consuming and polluting right now. There has been much research on happiness in recent years. We now know, with a high degree of scientific certainty, that what the major religious traditions have long maintained, is true: increased consumption, once we get beyond a certain point, does not translate into increased happiness. Environmental writer Bill McKibben cites some of the evidence:

Compared to 1950, the average American family now owns twice as many cars, uses 21 times as much plastic, and travels 25 times further by air. Gross Domestic Product has tripled since 1950 in the U.S. We obviously eat more calories. And yet—the satisfaction meter seems not to have budged. More Americans say their marriages are unhappy, their jobs are hideous, and they don't like the place where they live. The number who, all
things considered, say they are "very happy" with their lives has slid steadily over that period. . . . In the United Kingdom per capita gross domestic product grew 66 per cent between 1973 and 2001, and yet people's satisfaction with their lives changed not a whit. Nor did it budge in Japan, despite a fivefold increase in income in the postwar years.\textsuperscript{12}

Why should happiness not correlate with increased consumption? A key reason would seem to be that as incomes increase, one's purchases become increasingly of "positional" goods, goods desirable not for their intrinsic satisfaction, but for the status they confer relative to one's reference group. (I want a bigger house, not because I need a bigger house, or even because the larger dwelling will be more comfortable, but because the bigger house will give me more status in the eyes of my peers--and because failure to acquire the bigger house when others similarly situated are purchasing them will call my status into question.) So we find ourselves on a treadmill, running faster and faster (consuming more and more), yet staying in the same place (on the happiness meter).

So we see, if we place our faith in a regulated capitalism, and it delivers the wise governance and technological innovation that can keep us growing fast enough to keep investors happy, without inducing environmental havoc, the expected gain in overall well-being will be slight at best. But if we place our faith in capitalism and are wrong? Not the end of the world--but major, recurring environmental crises, and massive planetary misery.

\textbf{An Alternative?}
There is a deep assumption built into my argument that needs to be examined. If there is no alternative to capitalism, then we might as well assume that growth can go on forever in a finite world. A belief that allows for hope is surely better than one that counsels despair.

Can we conceive of an economic alternative to capitalism that is a) economically viable, b) not dependent on growth for its stability, yet c) conducive to the entrepreneurial innovation we will need to get through the current crisis? In my view the answer is clearly yes. Theoretical analysis, well supported by empirical evidence, strongly supports the thesis that a truly democratic economy could satisfy the above criteria, an economy that democratizes both work and finance—key arenas outside democratic control under capitalism. Let me sketch very briefly the basic institutions of an alternative model.

**Democratized Work**

Suppose each workplace is run as a democratically. Management is appointed by a worker council which is elected by the workforce, one-person, one-vote. These enterprises compete with one another in the market. Workers do not receive wages, but a specified share of the firm's profit. Such enterprises can be expected to be efficient, since everyone has a direct, tangible financial stake in the company's performing well. Empirical studies that compare democratic firms to comparable capitalist firms consistently find the former performing at least as well as the latter, and often better.¹³

But here is something interesting. Although democratic and capitalist firms are both motivated to produce efficiently and to satisfy consumer desires, they are strikingly different in their orientation toward growth. Under conditions of constant returns to scale, capitalist firms expand, whereas democratic firms do not. For capitalist firms aim at maximizing total profits,
whereas democratic firms aim (roughly) at maximizing profit-per-worker. That is to say, if the owners of a capitalist firm can make $X under present conditions, they can make $2X by doubling the size of their operation (assuming, of course, that they can sell what they produce at the going price). But if a democratic firm doubles its size, it doubles its workforce, leaving its per-capita income unchanged. It has no incentive to expand.

This is an enormously important structural difference, with implications that go well beyond environmental concerns. But let us focus on two that do bear on the question at hand.

One implication: Democratic competition is less intense than capitalist competition. Firms compete for market share, but not for market dominance. This means that democratic firms--when competing with other democratic firms--do not face the same "grow or die" imperative that capitalist firms face. Neither greed nor fear works the same way. However "greedy" workers may be, they cannot increase their incomes by expanding, unless economies of scale are significant. At the same time, they don't have to worry so much about being driven out of business by a more innovative or efficient rival. They have more time to adjust, to copy whatever successful innovations their rival has introduced.

A second implication: When innovation brings about a productivity gain, workers are free to opt for leisure or for workplace redesign to make jobs more meaningful instead of higher consumption. This option is virtually non-existent in a capitalist firm. Owners do not increase their profits by allowing their workforce to work less. To the contrary, increases in productivity often lead to workers working more or harder than before--since productivity-enhancing innovations often put jobs at risk. If unbridled consumption (consumerism) is a serious environmental threat, which most serious thinkers think it is, and if market competition is essential to an efficiently functioning economy, which most serious thinkers think it is, then it is
vital to have a system that offers *non-consumption incentives* to its businesses. Increased leisure is a readily available option in a democratic firm. But not in a capitalist firm. (As Marx so vividly documented in *Capital*, the struggle over the length of the working day has been ongoing from the inception of capitalism. The struggle for shorter hours, more vacation time, more leisure has *always* been resisted by capital--and for good reason. All else equal, firms do not make more money by giving workers more time off.)

**Democratized Investment**

A sustainable democratic alternative to capitalism must also democratize financial markets. That is to say, bring them under conscious collective control. Capitalist financial institutions, for all their complexity and opacity (stocks, bonds, futures, derivatives, swaps, auction markets, "structured investment vehicles," "collateralized debt obligations," etc.) exist for one fundamental purpose: to mobilize the private savings of individuals and make them available to existing or aspiring enterprises that want to expand production, upgrade their technologies, or introduce new products.

Suppose we decide not to rely on private savings for investment funds, so as not to be hostage to the "animal spirits" of investors. A substitute is readily available--taxation. Governments can generate funds for investment via taxation. Funds for public investment are already generated that way, so we know it can be done. A democratic economy will generate funds for private investment that way also. For technical reasons, the most appropriate tax is a flat-rate tax on the enterprise's capital assets. (This tax is a surrogate interest rate--the charge enterprises and entrepreneurs pay for their use of capital.) These tax revenues will fund the bulk of the new investment our society undertakes, both private and public.
These funds must be reinvested in the economy. There are various mechanisms that might be employed. To pick a simple formula: Let us allocate these revenues to regions and communities on a per capita basis. If region X contains X% of the nation's population, it gets X% of society's centrally-collected investment fund. (The per-capita formula has the virtues of simplicity, transparency and prima-facie fairness, but it is an oversimplification of what would doubtless be more complex in practice. There might be good reasons for deviating from this formula in specific instances. Funding for special projects that are national in scope might be allocated first, before the per capita formula is invoked. Certain underdeveloped, sparsely-populated regions might require, for a time, a larger than per capita share.)

These funds are then distributed to local and regional investment banks--public banks--charged with loaning them out to individuals and enterprises needing funds to start up, upgrade, or expand business operations. Loan applications are judged in terms of projected profitability, employment creation, and, if the community so desires, environment enhancement. Bank managers are public officials, democratically accountable, charged with effectively allocating the funds entrusted to them.

This democratization of investment has one consequence of fundamental importance to environmental sustainability. Economic stability and economic health, regional as well as national, no longer depend on economic growth, since investment no longer depends on the "animal spirits" of investors. Every year funds flow into each region. If there is insufficient demand for these funds, they can be rebated to taxpayers, thus keeping up effective demand. Society no longer hostage "investor confidence." There is no longer any danger of investors deciding to hold onto their funds, or move their funds abroad. Since the investment fund is tax-generated, all of it stays in-country; all of it gets put back into the economy.
In sum, the basic structure of what I call "Economic Democracy" consists of three fundamental institutions: democratic workplaces, a market for goods and services, and social control of investment. A capitalist economy is a market economy, but a market economy of a peculiar type, one that combines three quite distinct kinds of markets: labor markets, markets for goods and services, and capital markets. An Economic Democracy retains the second set of markets, but replaces labor and capital markets with more accountable, more democratic institutions. It is a "socialist market economy with democratic characteristics."

The "natural capitalists" might object at this point. They are eager to harness the entrepreneurial spirit to ecological ends. They like to point out the many opportunities that currently exist to make money by adopting in pro-environmental policies--more energy efficient manufacturing, green buildings, leasing rather than selling (to promote recycling), efficient water management, organic agriculture--the list goes on.

They have a point. A good case can be made for maintaining an entrepreneurial capitalist sector in a democratic, socialist economy. Where would private entrepreneurs get their capital? From private sources, if they want, but also from the public banks. There is no reason to restrict the loans these banks make to democratic firms only. However, to prevent an entrepreneurial firm from becoming a permanent capitalist firm that pays dividends to its owners "forever," long after their entrepreneurial activity has ceased, a simple provision can be enacted. To set up a capitalist firm, (i.e., one in which workers do not have the right to elect the firms management), a firm must obtain a license, which is good for a finite period of time, say X years (where X might be twenty or thirty), at which time the enterprise must be sold to the state. The state will then turn it over to its workers to be run democratically. Its originators may sell it earlier, to the state or to private individuals, but it may remain a private firm for only X years total. (It is worth
noting that the phenomenon of entrepreneurs selling off their start-ups is quite common under capitalism. The buyers are typically larger, existing firms.)

I have argued at length elsewhere that such an "economic democracy" would work, and would be more ecologically sustainable than even best-case forms of capitalism. It would also be more egalitarian than capitalism, more stable, and far more democratic.\(^{14}\)

**Implications for China**

I have argued that Kovel, although too apocalyptic in his pronouncements, is essentially right. Our species may be able to survive under capitalism, but it certainly won't *flourish*. I've pointed out that Hawken, the Lovins's and other "natural capitalists," while doing important work in proposing creative solutions to concrete problems, have not confronted two fundamental questions: 1) Does a healthy capitalism require a steady rate of growth? 2) Can exponential growth go on forever in a finite world? I have argued that the answer to the first question is "yes," and that it is foolish to the point of irrational to base one's hope for the future on a positive answer to the second.

But my argument that, although a positive answer to 2) is logically possible, it is irrational to base policy decisions on that possibility, relies on a key claim about growth and happiness, namely, that once consumption gets beyond a certain stage, there is little gain in overall happiness from consuming more. We find ourselves on a treadmill, running ever faster, but staying in the same place--those of us in the (over)developed parts of the world, that is.

But what about the eighty percent or so of humanity for whom consumption has *not* reached that stage where increasing consumption no longer correlates with increased happiness? Specifically, what are the implications of this analysis for China, which certain contains a substantial fraction of such people?
Without question, China's recent economic growth has astonished the world. Singapore's former UN ambassador, Kishore Mahbubani, has expressed it well: "To watch the most populous society in the world experiencing the most rapid economic growth is like seeing the fattest boy in class winning the 100-meter hurdle." This growth has, among other things, lifted hundreds of millions out of poverty, the greatest reduction in poverty in so short a period of time in human history.

The Chinese people appear to be deeply pleased with these developments, as well they should be. As you probably know, a recent Pew Research Center poll found 82% of those polled reported the economic situation of their country to be "good" and 86% said they were satisfied with the direction the government is taking the country. These figures contrast sharply with the attitudes of my countrymen, only 20% of whom thought the economic system good and only 23% of whom thought the government was on the right track.

Of course these poll results may not reflect the country as a whole, since those polled were mainly residents of relatively prosperous cities. Half of China is still rural, and per capita income in rural areas is less than a third that of urban areas. Tens of millions of people remain desperately poor. Still, amazing things have happened in China, and the people know it. The people generally trust their government--at least government at the upper levels--and they are not wrong to do so. Mahbubani's assessment seems right: "After more than a hundred years of anarchy and misrule, China has amassed the best governing class it has seen in generations."

Certainly the official pronouncements of this government are encouraging. To achieve a moderately prosperous, sustainable, harmonious society is a worthy goal--and not only for China. ("Moderate" prosperity would be a worthy goal for us, too, but no politician could get elected on such a platform, for scaling back consumption to "moderate," will, as we have seen,
trigger a recession.) The call for "a new socialist countryside" is also significant. If this project is successful, it will be an accomplishment of world-historical significance, signaling an alternative conception of "modernity," one that gives hope to the billions of the world's poor who live in rural areas, not requiring them to seek salvation in the mega-slums of poor-country cities.

Of course worthy goals are one thing. Achieving those goals is quite another. It's not news to anyone that China has massive environmental problems that could put these worthy goals out of reach. What is to be done? How does our analysis bear on this question?

In 1995 Lester Brown, Worldwatch Institute founder and then-director, created a stir, particularly in China, with a gloomy assessment, set out in *Who Will Feed China?* His grim prognosis turned out to be false. As he reports in his most recent book, *Plan B 3.0: Mobilizing to Save Civilization*,

In April 2005, the World Food Programme and the Chinese government jointly announced that food aid shipments to China would stop at the end of the year. For a country where a generation ago hundreds of millions of people were chronically hungry, this is a landmark achievement. Not only has China ended its dependence on food aid, but almost overnight it has become the world's third largest food aid donor.

Despite his occasional misjudgments, Brown remains one of the key authorities on the question of planetary environmental degradation. In what follows, I will rely on his recent assessments.

There are lessons to be learned from China, he tell us, many of them positive:
♦ China has been in the forefront in implementing successful agricultural strategies: multicropping ("if China's farmers can extensively double-crop wheat and corn, then U.S. farmers could do the same if agricultural research and farm policy were reoriented to support it" (p. 178)), acquaculture ("China accounts for an astounding two thirds of global fish farm output," much of it integrated with agriculture, enabling farmers to use animal wastes to fertilize ponds (p. 184) and a "new protein model . . . that relies on ruminants and roughage" (feeding the wheat straw and cornstalks of double-cropped wheat and corn to cattle, supplemented with small amounts of nitrogen (p. 187)).

♦ China is the world leader in using compost toilets to reduce the demand for urban water. Over 100,000 are now in service (p. 204).

♦ The installation of some 40 million rooftop solar water heaters in China is "perhaps the most exciting recent development in the solar world economy" (p. 246). These have been manufactured by 2000 Chinese companies, and are now used in rural villages without electricity as well as in cities.

♦ Solar electricity is also growing rapidly. China overtook the United States in solar cell production in 2006. Shanghai is aiming for 100,000 rooftop solar cell installations--a small fraction of what is needed, but an important beginning (p. 250).

♦ Shanghai also gets high marks for creating "a nutrient recycling zone around the city. The municipal government manages 300,000 hectares of farmland to recycle the city's night soil. Half of Shanghai's pork and poultry, 60 percent of its vegetables, and 90 percent of its milk and eggs come from the city and the immediately surrounding region" (p. 206).
Of course China--and the world--still face massive environmental challenges, among them, water shortages, desertification, improperly treated toxic waste and air pollution. For Brown the most significant lesson from China's success to date is negative. He entitles an early section of his book: "China: Why the Existing Economic Model Will Fail" (13). He notes that if the Chinese rate of growth should remain high for two more decades (slowing only to 8%/year), then, by 2030, Chinese income per person will equal that of the United States today. If this income translates into American-style consumption, China will have more cars than exist in the world today, and need more oil than is produced today. It will have paved over more cropland than it now plants in rice. Such a future is impossible.

What China is teaching us is that the western economic model--the fossil-fuel-based, automobile-centered throwaway economy--is not going to work for China. If it does not work for China, it will not work for India, which, by 2030 may have an even larger population than China's. Nor will it work for the other 3 billion people in development countries who are also dreaming the "American dream." And in an increasingly integrated global economy, where we all depend on the same grain, oil, and steel, the western economic model will not work for the industrial countries either. (14)

That is to say, capitalism won't work--not in the long run, not even in the relatively short run. Of course Brown doesn't say that exactly. He decries the "throwaway society" that constitutes the "American dream," without interrogating the reasons for our addiction to ever-increasing consumption. He ignores the fact that the United States now spends more than $150 billion per year on advertising (roughly what is spent on all forms of education, nursery school
through college), a figure that constitutes but a fraction of the overall "sales effort." He fails to note that this expenditure is not "irrational"--not from the point of view of the enterprises involved, who must be constantly on guard lest sales and profits slip, making them vulnerable to bankruptcy or hostile takeover, not from the point of view of overall economic stability, since a decline in consumption signals a recessionary downturn that is bad news for everyone. Ceaseless growth may be irrational from a planetary perspective, but it is a functional requirement for the dominant economic structures that underlie our present world.

A side comment is in order here. Lester Brown, like the overwhelming majority of mainstream Western environmentalists, stays clear of the C-word--capitalism. But this reticence is beginning to give way. Consider the recent book, *The Bridge at the End of the World: Capitalism, the Environment and Crossing from Crisis to Sustainability*, published by Yale University Press this year. Its author is James Gustave Speth, currently Dean of Yale University's School of Forestry and Environmental Studies. Speth was President Jimmy Carter's chief White House environmental advisor. He then served as head of the UN's largest agency for international development. He is, in the words of *Time* magazine (which he quotes in the book's introduction), the "ultimate insider." Speth has come to agree with the analysis set out in the first part of this paper. He doesn't spell out an alternative as I do, and he doesn't want to call the future "socialist," but he has become persuaded--reluctantly he says--that "capitalism as we know it is incapable of sustaining the environment." He acknowledges that in theory "green growth" could be benign and restorative, but "theory is not reality." We must move to a "post-growth" economy. In his view, whether the "something new" that we must achieve "is beyond capitalism or is a reinvented capitalism is largely definitional."19
If Speth and I are right, then China--and the rest of the world--must transition to a relatively steady-state economy, or at least one that does not require ever-more consumption for economic stability. I have argued that Economic Democracy, but not capitalism, is compatible with a such an economy. But what about transition--getting from here to there, from an economy that depends for its stability on steady growth, to one that does not? Clearly the transition question is very different for China than for the United States. The United States needs to cut back on consumption so as to bring its consumption into line with global, per-capita, resource and pollution allotments that are sustainable, whereas China still needs to grow--but to grow in an ecologically and socially sustainable manner. Let us focus on the case of China.

It is obvious that the government will have to play a major role here. Market forces are important, but the overall patterns of development cannot be left to unregulated markets. This means that investment patterns must be controlled. Uncontrolled investment will flow to the richer regions and into product lines that those with money can afford, exacerbating regional and personal inequality, undermining social stability. Uncontrolled investments will pay scant heed to ecological "externalities." The need to control investment--and to be free from the tyranny of financial markets--points to that basic feature of Economic Democracy designated as "social control of investment." China, despite constant prodding by Western governments, economists and financial "experts," has not "opened up its financial sector"--nor should it do so. It is absolutely crucial that the government maintain major control over its investment flows.

This is not to say that the government shouldn't use market incentives to entice private investors to invest in ecologically important technologies and products. You will recall that Economic Democracy retains an entrepreneurial capitalist sector. This sector could serve two distinct ends in a county such as China. The Natural Capitalists are right that if "natural capital"
is appropriately priced, there will be money to be made in selling environmentally-appropriate products. To take advantage of this possibility, we need imaginative entrepreneurs. For example, if the government taxes scarce water resources while providing subsidies to farmers who install irrigation efficient technologies (ideally the drip system, which is both labor-intensive and water-efficient), this will spur entrepreneurial firms (both capitalist and democratic) to manufacture and install such systems. (Drip systems are currently in use on only 1-3 percent of Chinese land, as compared to 4% in U.S. and much, much more in Israel, Cyprus and Jordan.20)

The entrepreneurial capitalist sector serves a second crucial function, one not directly related to the question of ecological sustainability, but vital to China's social stability: employment creation. We have here a paradox of sorts. A deep--and correct--criticism of capitalism, one that goes back to Marx, is that it cannot function effectively under conditions of full employment. Unemployment is the basic disciplinary stick that keeps the workforce in line. When unemployment rates get too low, when--as the financial press likes to put it, "labor markets become too tight"--workers press for higher wages and more benefits, which, when granted, cut into profits directly or, if the costs are passed onto consumers, generate inflation. In either case investor confidence is shaken, thus triggering an economic contraction.

Capitalism is incompatible with full employment. But--this is the paradox--democratic firms are likely to be less effective at increasing employment than capitalist firms, for the structural reasons already noted. Democratic firms are more reluctant to lay off workers when sales are down, but they are less likely to take on more when sales are good, since existing members must share the increased income with the newcomers. To put the matter technically: under conditions of constant returns to scale, capitalist firms will expand employment,
democratic firms will not. (The one decisive advantage command economies have, relative to both capitalist and democratic market economies, is their ability to provide a job for everyone. Unfortunately, this advantage is insufficient to counter the massive inefficiencies and lack of autonomous innovation that such economies experience.)

Entrepreneurial capitalist firms will not, in themselves, give us full employment, but they can play an important role in achieving this important objective. Governmentally established investment policies must be concerned to encourage not only ecologically appropriate development, but employment creation as well. Neither full employment or ecological sustainability can be achieved under free-market capitalism, but an entrepreneurial capitalist sector in a socialist society can play a significant role in achieving both these ends.

If entrepreneurial capitalist firms have a significant role to play in achieving a sustainable, harmonious society, what about democratic firms, one of the defining institutions of Economic Democracy? Apart from the fact that such firms instantiate in a direct, tangible manner the core socialist value of worker-control, they are also important from an environmental perspective. A democratic firm is more likely than a capitalist firm to be careful about toxic working conditions, and about polluting the immediate environment, which is, after all, where members and their families live. Democratic firms are also more stable geographically than capitalist firms. Workers never vote to move their enterprises to other regions (or other countries), so they will not pollute one place, then move on to another. And of course, from the longer-term perspective of a "post-growth" economy, democratic firms are a better fit with such an economy, since they lack the inherent expansionary dynamic of capitalist firms.

There are two major problems with democratic firms in a transitional economy, both related to employment creation. One has already been noted. Existing democratic firms are less
likely to take on more workers than successful capitalist firms. The second problems: it is more difficult to start up a democratic firm than a capitalist firm. "Socialist entrepreneurs" must possess the business skills and drive of their capitalist counterparts, as well as the social skills to bring together a workforce committed to democratic participation. And they must be willing to share from the beginning both their managerial authority and the financial rewards of their entrepreneurial initiative. Clearly, it is much easier to entice skilled and enterprising individuals to undertake the effort and risk of setting up a capitalist firm than to entice them to set up a democratic firm. It is much easier (although by no means unproblematic) to democratize an existing firm than to set up a democratic one from scratch.

Both of these difficulties contribute to the fact that democratic firms are not as effective at generating employment as are entrepreneurial capitalist firms. This is a serious matter, since unemployment is a major concern, not only in China, but for the world, one that may be as serious as environmental degradation. (I would venture to say that the human misery and social instability caused by large-scale unemployment is much worse at present than the misery and instability caused by ecological damage.) This massive global unemployment is mostly caused by the dynamic of global capitalism, which offers no prospect whatsoever of global full employment, but--the paradox we encountered earlier--the transition to a post-growth, full-employment "moderately prosperous, sustainable, harmonious society" requires the efforts of capitalist entrepreneurs.

The fact that entrepreneurial capitalist firms are better at generating new employment than democratic firms does not imply that no efforts should be made now to encourage workplace democracy. Technical and financial support should certainly be given to workers wanting to establish worker cooperatives, and efforts should be made to introduce ever more
worker participation into existing enterprises—which often leads to efficiency gains as well as increased democratization.

(It is interesting to speculate as to the future of China's most innovative enterprise form, the "township or village enterprise." Rural household businesses were an important part of China's traditional economy, but they were effectively eliminated during the 1950s, during which time the countryside was effectively deindustrialized. However, during the Cultural Revolution the state began to encourage rural re-industrialization under the rubric of "commune and brigade enterprises" designed primarily to "serve agriculture," care being taken to avoid the mistakes of the Great Leap Forward. These enterprises often formed the basis for the enormously dynamic and successful TVEs that flourished from the beginning of the 1978 reform period until the mid-90s. Of course most of these have now been "privatized," ownership now (usually) in the hands of former managers, although workers often have shares as well. Thus we have a post-Revolution sequence in the countryside: community-controlled command enterprises → community-controlled market enterprises → managerial-capitalist controlled market enterprise. We might well envisage a final stage in which the managerial controlled capitalist enterprises are democratized, giving us the extended sequence, community-controlled command enterprises → community-controlled market enterprises → managerial-capitalist controlled market enterprises → worker controlled market enterprises.)

Above all, we must keep in view that fact that a sane, sustainable economy must ultimately be a democratic economy, not a capitalist economy. An important corollary: although entrepreneurial capitalists have an important role to play in a market socialist society, care must be taken to prevent this class from becoming the dominant class. One great advantage
China has relative to the West in achieving a sustainable economy is the absence of a deeply entrenched, immensely powerful class whose interests demand perpetual growth.

Conclusion

I have argued we must get beyond capitalism if the human species is to flourish to the full degree that our modern technologies make possible. The fact of the matter is, the massive environmental problems we face are not unrelated to other social problems: national and global unemployment, national and global poverty, political dominance by an immensely wealthy, deeply entrenched class that undercuts genuinely democratic governance, an increasingly harried and insecure "middle class" that finds its opportunities for self-, family- and community-enhancing leisure time ever more restricted. The dominant economic order of our time, namely global capitalism is causally implicated in all of these problems.

We need to recognize institutional reforms are possible that address, simultaneously, all of these problems, including the environmental ones--and that these reforms must take us "beyond capitalism." Few mainstream theorists are willing to admit this, but there is at least one Nobel laureate (in economics) who recognizes that capitalism itself is the problem. Let me call your attention to a little noted, almost offhand, remark made by Amartya Sen in this 1999 treatise, Development as Freedom--a work based on, interestingly enough, a series of presentations given to the World Bank.

The solutions to these problems--inequality (especially that of grinding poverty in a world of unprecedented prosperity) and of public goods (that is, goods people share
together, such as the environment) will almost certainly call for institutions *that take us beyond the capitalist market economy.*

I think we are in position now to see what those institutions might be.

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**NOTES**


3. Hawkins, Lovins, Lovins, p. 2

4. Hawken, Lovins, Lovins, p. 1

5. Kovel, p. 268, citing *Capital*, v. 3.


8. It might be noted that Marx also used the term "animal spirits," but in this case, in conjunction with workers, not investors. He noted how cooperation enhanced productivity by stimulating the "animal spirits" of the producers, but how detailed division of labor disrupted those "animal spirits." See *Capital*, v. I, Chapters XIII and XIV.


11. Quoted by Brown, p. 270.


13. See my *After Capitalism* (Lanham, MD: Rowman and Littlefield, 2002), Chapter Three for references. [Chinese translation (Beijing: Social Science Documentation Publishing House, Chinese Academy of Social Sciences, 2005)]. For a more technical presentation and defense of

14 See the preceding note for the references.


16 Ibid.


18 Lester Brown, Plan B 3.0: Mobilizing to Save Civilization (New York: W. W. Norton, 2008), p. 175. The page numbers in the text that follows refer to this book.


