

Labor's Declining Share and Future Quality of Life

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For the past two and a half centuries industrializing societies have enjoyed a trend in which technology, engineering, and resource discoveries steadily reduced the cost of energy and materials. As the costs of these inputs declined, the relative value of labor rose. This trend is often referred to as rising labor productivity: an hour of labor input was able to produce more and more output, measured both in bulk terms and in dollar value.

Over time this trend has meant rising family incomes, and has created the possibilities for levels and kinds of consumption among well over half of the human population that were previously dreamed of only for the rich. This achievement occurred along with huge population increase, so that the actual number of people today whose material needs are comfortably met is far greater than the number of human beings who were alive when the industrial revolution began.

There are strong reasons to believe that this trend is now due to be reversed, because of the rising cost of the other major inputs to production: energy and raw materials. There are three additional reasons for a declining share of this nation's wealth going to labor which I will only mention briefly: they are outsourcing; automation; and the political processes that have diverted more profits to shareholders and top management, away from labor.

The political processes are quite peculiar to this country; they are part of a culture that allows economic power to become political power; they could be reversed, if our citizens saw things differently. This issue will recur in a different context when I talk about the importance of misinformation.

Outsourcing is an interesting phenomenon that some economists understand as part of a process whereby all similar inputs to production, around the world, may come to have the same price: an hour of work in China and hour's work in the U.S., if they are equally productive, should tend toward commanding the same salary. This is good or bad depending on whether you are a worker in China or the U.S.. Some aspects of this tendency will likely be reversed, however, as the price of transportation rises.

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While for two centuries workers have feared losing their jobs from automation, this has mostly not happened – automation has occurred, but the demand for an exploding quantity of goods and services has outstripped the ability of robots to replace humans. However, as we get into leaner times the fever of cost-cutting, pioneered by Wal-Mart and Ikea, is spreading. Foxcomm, with 1.2 million employees in China, is under pressure to raise wages, as Chinese workers find that they have alternatives to the 14-hour, 6-7-day week that has made that country a powerhouse of production. For the moment the workers are winning in their wage demands, but Foxcomm is planning to invest in millions of robots in order to automate more of its production. (*NYTimes*, Feb 20, pps B1-B2)

In another example, a *New York Times* op-ed by Thomas Friedman in January, 2012, described a company called E la Carte that has produced an electronic gadget that, sitting on a restaurant table, allows diners to make their selections, including special requests, send them to the chef, and then pay, all on the same machine. The cost to the restaurant owner is projected at 42 cents per hour per table, making it cost effective to hire only enough waiters to bring the food from the kitchen to the tables, fill the water glasses, and clear away used dishes. That's a rather dramatic example of how automation can, theoretically, do away with a significant number of jobs. The arts and the artists in this country would really suffer from the reduction in opportunities for struggling artists to pick up wait-person work.²

The possibility of ever more automation raises an important social issue: If a society produces an amount of goods and services sufficient to adequately provision the whole population, but only a fraction of the population is required to be involved in this production, then how are the goods and services to be allocated? If only those who work at producing them receive income, the rest starve – and, on the macro level, demand falls and the economy falls into recession. This result has been the specter haunting ever-more-efficient capitalist production since the beginning.

At the moment, however, there is another, more immediate danger: the strong likelihood that the prices of energy and raw materials will begin to rise against the price of labor. As the quality of resources – minerals, water, fossil fuel energy sources – trends down, their price goes up; you have to pay more to get resources that can accomplish the same amount. I will just quote one pessimistic assessment on the subject – a statement from Richard Heinberg's book, *The End of Growth*:

“When the quality of an ore drops the amount of energy required to extract the resource rises. All over the world mining companies are reporting declining ore quality. So in many if not most cases it is no longer possible to substitute a rare, depleting resource with a more abundant, cheaper resource; instead the available substitutes are themselves already rare and depleting.” (Heinberg 161)

Cost-competitive producers always strive to reduce the quantity of more expensive inputs to production. When it costs more to get a given amount of useful energy or a certain quality of ore,

² U.S. Government statistics list 2.2 million workers in the "waiters and waitresses" category. http://bls.gov/oes/current/oes_nat.htm#35-0000

the employer will try to use less energy and less of that ore. The relative value – and therefore the wage – of labor declines as workers can't produce so much when they have less inanimate energy to work with, or lower quality raw materials. Thus a decline in the quality, and hence the productivity, of non-labor inputs – energy and raw materials – is likely to result in a decline in labor productivity. This result goes against the predictions of standard economic growth theory, which, assuming that there are always perfect substitutes for any material input to production, does not conceive of the possibility for the kind of global decline in resource quality just cited.

Automation, while using less labor, still requires energy and materials. With or without great increases in automation the rising cost of these non-human inputs threatens to reverse the process that has been going on since the beginning of the industrial revolution – a process that, by making labor more productive, has resulted in higher wages and rising living standards. It all depended on being able to substitute increasingly cheap material and energy inputs for human labor.

The most unpleasant consequence of reversing this process is shown as possibility #1 in the following set of options:

1. Increase work hours; if worker productivity declines due to declining resource quality and quantity, wages will go down. If families want to maintain the same income, longer work hours will be necessary.
2. The second option is the opposite: accepting that lower labor productivity means lower hourly wages, and recognizing the society-wide requirement to trim the size of the economy to fit within a finite ecosystem, people might choose – or be forced – to reduce work hours, which means a reduction in aggregate output, and in average household consumption.
3. The third option is to find ways to produce the same (or greater) quality (by which I mean end use value) of the desired outputs, with less inputs of resources and less labor hours.

The first option looks really unappealing. There are a lot of reasons to believe that people would, on the whole, benefit from a choice to reduce the amount of time that families now spend in formal work. Moreover, it doesn't address the other sides of the resource constraints – the fact that the total volume of human production cannot be sustained on a planet that is showing ever greater signs of ecological stress.

For a long time there has been a quiet conversation about option number 2, including writings by, for example, Robert Frank, Herman Daly, Juliet Schor, Robert Lane and Duane Elgin; précis of their work can be found in in the Global Development And Environment Institute's series, "Frontier Issues in Economic Thought."³

³ See especially *The Consumer Society* and *Human Well-being and Economic Goals* both published by Island Press, 1997. See http://www.ase.tufts.edu/gdae/publications/frontier_series/index.html

Option #2 looks for ways to work less, produce and earn less, consume less – while seeking ways that this change could increase human well-being and ecological health. The first part of this – the “less” part – happened by accident in the recession that started in 2008. Most economists, as well as politicians and others, are eager to get back on the treadmill of endless economic growth. Most of the socially-conscious economists have grown up believing that growth was the only way to alleviate poverty, while the less caring economists have jumped on the same train because it was pleasing to the corporations. So altruistic and greedy motives have for a long time pulled economics in the same direction – but it may well not be a sustainable direction. The big question is: how do you jump off of that train, or stop it without causing a wreck? Some conclude from the wreck of 2008 that you just can’t. The best beginning of an alternative – a vision of how to move from a growth-addicted to a post-growth economy while actually increasing individual and social well-being – is supplied by Peter Victor, in the economic model whose first draft he describes in his book, *Managing Without Growth: Smaller by Design, Not Disaster*.

It is very important, in this context, to distinguish between rich and poor regions. The need to alleviate real poverty must remain a high priority. However economic development in the context of 21st century resource decline must in many ways be understood differently from development in the context of the 20th century belief in infinitely replenishable or substitutable natural resources. Development must not aim at enabling third world countries to live in the style of the U.S. in the 20th century. That style will increasingly be seen as impossible for the U.S., as well as for the rest of the world. Rather, development must be about identifying sources of well-being that do not depend on heavy use of natural resources. In this respect, the U.S. must also undertake a new kind of development, one that emphasizes well-being over wealth.

The foregoing statement assumes that the third option in the list above cannot be achieved in a manner that permits humanity to have a future that will look very much like the past. When *Limits to Growth* was first published I was working with Buckminster Fuller, who was widely known as a technological optimist; in fact I recall a sense of tension between him and the Club of Rome adherents over the question of whether the limits described in that publication could, in fact, be overcome by technology. Bucky would have supported the lesson from option 3 which says that, even while the price of energy and materials is rising, the need for them will be declining, so the value – and therefore the income – of labor could remain at least steady.

Figure 1, below, shows, very stylistically, what we are up against in hoping to achieve this. You should understand the green line as moving through time, representing a very abstract, general concept of the level of technology – specifically, new discoveries in our ability to produce what we want with decreasing inputs of materials and non-renewable energy. The starting point of this imaginary line is not “now”, but rather the time in the future when we have made use of most of the stock of technologies for energy and materials conservation that are now available, but are not yet in common use. The brown arrows attacking the upward trend of the line are resource constraints.

The question remains open in my mind about the extent to which the kinds of resource constraints described by Richard Heinberg – the constraints that reduce our options in what ores we use, and make it more and more costly to access traditional forms of inanimate energy – will

prevent the needed kind and degree of future technological progress. One thing is for sure: the longer we wait to push hard for the needed innovations, the cleverer the new technologies will need to be, to get around the ever-greater resource constraints.

Declining Resource Quality

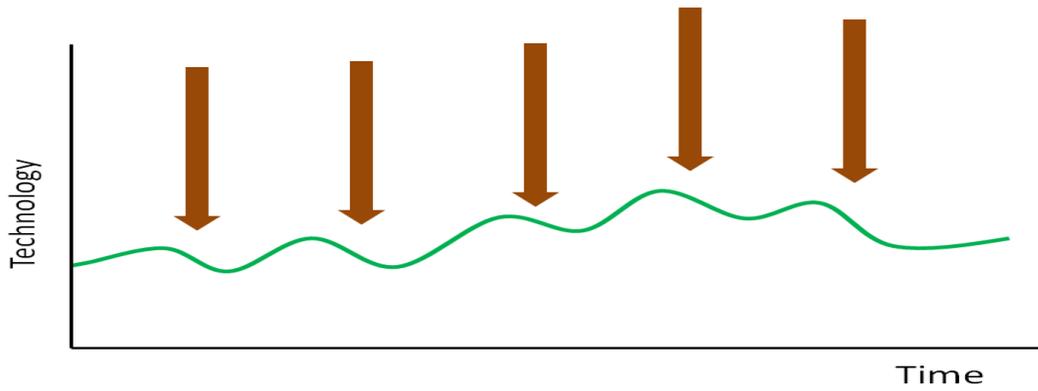


Figure 1 Technology vs. declining resource quality

Technological inventions and improvements are made by people, alone or in groups, but they can then be embedded in machines and systems, and written down in books. However application and continued technological progress is not something that can happen without the appropriate levels and kinds of human capability; even now we can see how difficult it is to get our society to apply the known technologies for conserving energy.

Counter Forces

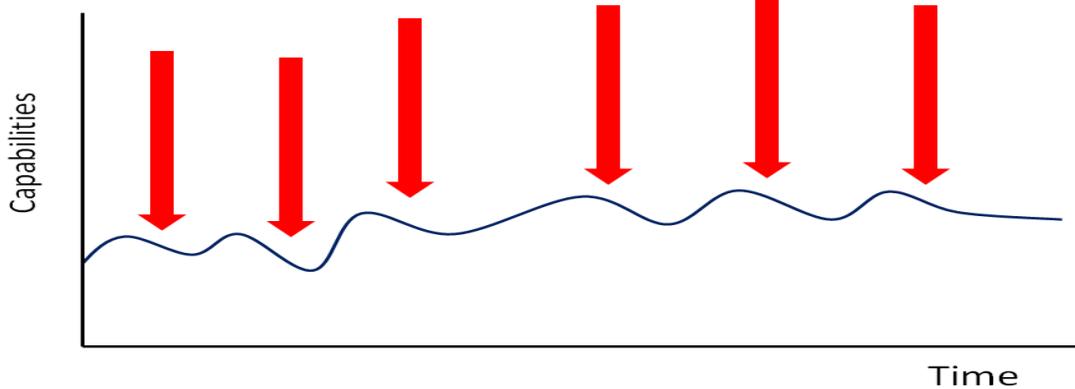


Figure 2 Human capabilities development vs. regressive social forces

Figure 2 shows a dynamic that is similar to that in Figure 1, but this time the line that we would like to see moving upward over time represents the development of human capabilities. I use this term to include knowledge, problem-solving ability, self-discipline, a realistic understanding of what contributes to well-being, and caring and will to achieve well-being, for self and for others, in the present and the future. It was Amartya Sen who has brought the term “capabilities” into prominence⁴: my use of it overlaps with, but is not identical to, his. As portrayed here, the hoped-for rise in such human capabilities, like technological progress, also has to contend against counter forces.

Counter forces is a rather neutral term. In fact, what I see as the dangers here are not just abstract forces, but people and institutions that are purveying misinformation on a whole host of issues, including, most obviously right now, the dangers of climate change, but also including a subtler drumbeat of misinformation on what is involved in well-being. This second type of misinformation comes from advertising and media that spread a materialistic, consumerist, instant-gratification culture. I have spent the last 20 years working against a related kind of misinformation that is spread, in economics classes as well as media, about how markets work, when they are the solution, and when they are not. There are also other counter forces that work against good education; while poverty, of course, is a force that can operate in homes and schools against various kinds of early childhood development.

As long ago as 1995, in an article called “The ingenuity gap: Can poor countries adapt to resource scarcity?”, Thomas Homer-Dixon made some pessimistic projections about how environmental degradation, causing declining resource quality and hence rising cost for most consumption and production goods, would translate into declining GDP, declining government resources, and thus create financial constraints on social programs in health and education. He described an increasingly impoverished society unable to provide the health and education that would enable its citizens to think their way out of a downward spiral of environmental degradation and loss of initiative, inventiveness and intelligence.

Figure 1 showed technology, as an abstract force, struggling against the decline in resource quality. If Homer-Dixon’s pessimistic scenarios were to dominate, when we think of the negative forces that might work against technological solutions to our predicaments we should consider the degradation of both kinds of resources: human capabilities as well as natural resources.

Figure 3 in fact shows a more complex set of forces that will require advances in both technology and human capabilities if we are to achieve adequate nutrition for all people over the remainder of this century. Today we are not very close to that goal, as a large proportion of the world’s people are now suffering from inadequate nutrition, stunting their mental and physical capabilities in the way Homer-Dixon described. This is in spite of the fact that right now there is actually enough food produced in the world so that we could achieve the goal of adequate nutrition for everyone – if it was distributed according to need, rather than ability to pay; and if

⁴ See for example *Commodities and Capabilities*, which focuses on the capability to function, i.e. what a person can do or can be, as of prior importance to what she can have.

the need for basic nutrition had high priority over the meat-heavy demands, and the energy demands, of the rich world.⁵

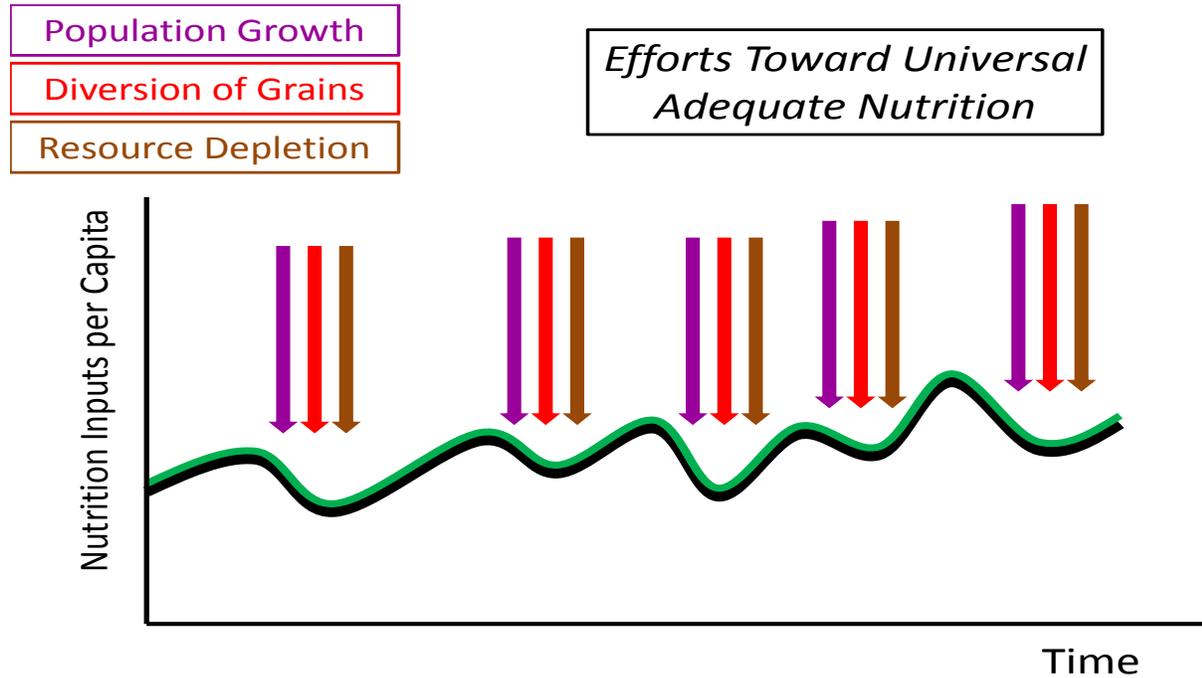


Figure 3 The struggle for universal, adequate nutrition

In Figure 3, nutrition inputs per capita is the line that we would like to see trending up over time. To achieve this, per-hectare output of staples must rise, first, to bring the whole world to an adequate level of nutrition, and then output must keep rising to keep up with population growth. In addition to population growth, the desirable upward trend is also in contention with the decline of resource quality. The resources of particular concern in this case include the complex quality of the soil and its organic and inorganic nutrients. Here I believe there is some good news. In recent decades this subject has become much better understood, and the movement to organic, low-input agriculture holds promise for reversing the decline of soil quality, and, some say, moving quite quickly to improve it. However, the other critical resource for agriculture is water; even as soil degradation may become less of a problem, water scarcity and quality will surely become more of one. The brown arrows, labeled “Resource Depletion,” refer to the combined effects of soil and water on the possibility of raising output per hectare.

⁵ “In the global policy debate on the responses to the current food-price crisis, an important new actor is playing a critical role advocating for more ambitious change: the United Nations Special Rapporteur on the Right to Food since 2008, Olivier De Schutter. . . ., the right to food approach uses a human rights framework to assess full access by all to adequate food.” (Wise and Murphy 2012 pp 25-26)

The red arrows, labeled “diversion of grain” indicate both the diversion to biofuels as well as the demand for meat. It is necessary to grow a lot more staple grains to feed people if the grains are first going to be eaten by animals – chickens, pigs, cattle – before they are turned into human food. If projections for economic growth in the less-wealthy areas of the world have any validity, the global demand for meat will rise substantially. The other major diversion is exemplified by the 2007 decision to subsidize corn ethanol in the U.S.. Along with other incentives to use grain for biofuels, this has diverted nearly 30% of the corn raised in the U.S. to energy production, and substantially raised the global price of corn, as well as other grains.

As a comparison to the preceding highly abstract figures, figure 4 uses real data to show how diversion of U.S. corn to ethanol has reduced the amount available for human and animal consumption from 236 million tonnes in 2000 to 208 million tonnes in 2009 – a reduction of nearly 12%. (This does not show the growing use of corn as animal feed, or for other uses.)

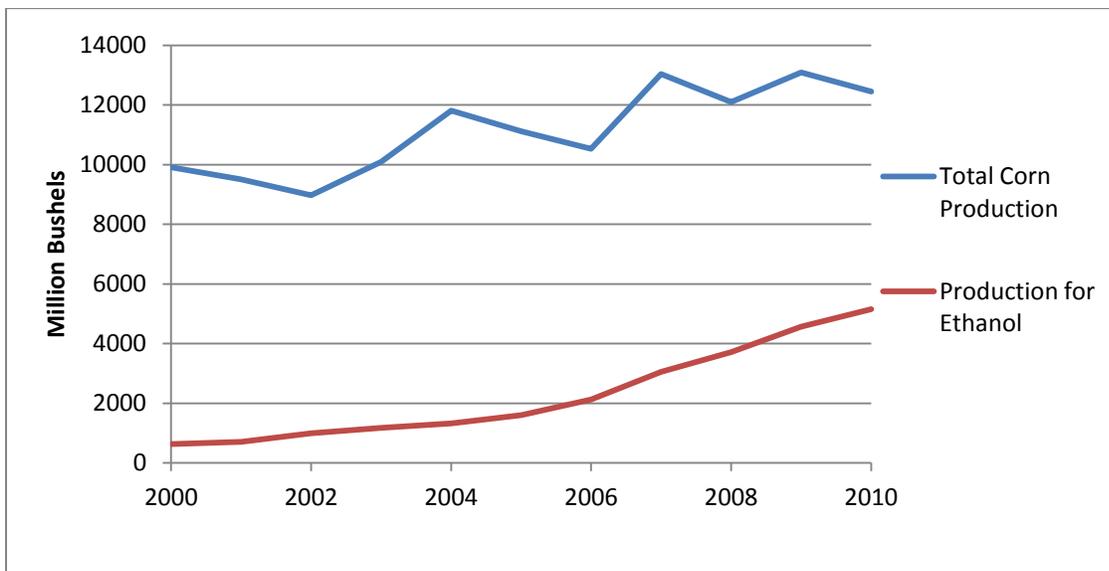


Figure 4 The effect on global grain prices of the U.S. *Data from the Statistical Abstract of the United States, U.S. Census Bureau, plotted by Brian Roach*

Figure 4 is included here in part to provide a contrast to the first three figures, which need to be understood as strictly conceptual. They are not based on real data, nor do they suggest specific dates for the hypothetical rises and falls in the imagined trend lines. Each trend line is intended only to illustrate one of millions of possible future sets of ups and downs. Forty years hence it will be possible, looking backwards, to plot a line that shows, for example, the increase – or decrease – in the percent of global population adequately nourished, using some standard definition for adequate nourishment. One might then be able to identify the forces that were most effective in working both for and against movements in such a line; they will likely include forces I have not thought of.

My colleague, Brian Roach, who kindly put the slides together for me, tends to be an optimist. I kept trying to get him to draw the lines we were imagining – technology, human capabilities,

nutrition per capita – so that they would show the positive and negative forces in a draw, but it went against the grain for him not to have the lines trend up at least a little. Even the question of what is the range of possibilities – for moving a lot higher in the foreseeable future, or for plunging much lower – is a matter on which people have very different opinions.

At this point we come to the commonplace conclusion: “It all depends” – “It” being a future in which humans can thrive within a healthy natural world; and what that depends on is the relative strength of the positive forces – including technology and human capability development – on the one hand, versus resource degradation, population growth, and regressive social forces on the other.

Even remarkable advances in achieving the third option I had described early on – of achieving more desired outcomes with less physical inputs – will require considerable rethinking of what it is that we want. Howard Brown, a friend of mine from the days when we both worked with Bucky Fuller, has developed a company called dMASS, which is based on the following premise, as Brown recently described:

People don't really want toothpaste, they want oral hygiene. And when someone comes up with a way to deliver that fundamentally weightless and invisible benefit without the toothpaste at all, customers will want it. Our goal is to get companies competing to deliver the most real value with the least resources, and to get people buying to get the most measurable benefits with the least amount of the earth reorganized to deliver them.
(email communication, Feb. 2012)

This technologically optimistic approach envisions a world in which companies, or other economic organizations – including households and communities – produce all that is needed to maintain rising well-being, in theory for all.

Looking at all the figures above I am struck by the central importance of human capabilities. I have used this term to include

knowledge;

problem-solving ability;

self-discipline;

a realistic understanding of what contributes to well-being; and
caring and will to achieve well-being, for self and for others.

These are qualities of personality and moral development as well as of intellect. They are essential for social cohesion and community resilience as well as for progress in developing technology and also for applying it to issues such as producing food or sustainable energy. Their salience is evident when considering a variety of decisions faced by people today, at all levels.

Take the subject of water, for example. Individuals need knowledge to support intelligent choices, whether, on the one hand, their options range from free tap water to costly bottled water, or on the other hand they are in a situation where all available water is contaminated and people

need to know how to treat it to protect their health. Developed capabilities are also essential for people who are making the larger societal decisions about whether or what to charge for public water supplies, how to allocate water between agriculture, household, and other uses, or engineering and ecological decisions about taking water from rivers, lakes or aquifers.

Another example could be in relation to the homes we live in. People in the U.S. are now living in homes that, on average, have two or three times the amount of space our parents enjoyed, but surveys on life satisfaction do not show that this has increased well-being. Meanwhile one of the fastest growing industries in the U.S. is storage; not just because people are moving more, but because so many people have purchased a lot of things they thought they wanted in their homes, but don't have room for. All of that stuff in storage implies that a lot of people are at work making a lot of things that aren't needed. Indeed, the suffering now endured by people who have lost their homes in the bursting of the housing bubble is related to the pressures that had ever more Americans spending more than 30% of their incomes on housing, for a variety of reasons that are related to a combination of poor government policies and consumerist pressures.

Privatizing the production of social goods forces profit-making competition where social cooperation would be more efficient. The consequences include very sub-optimal urban design and auto-dependent transportation systems as well as a health care system that is unaffordable for many in the U.S.. And then, of course, there are all the bad political decisions in this country about government investment, through subsidies and tax breaks in oil and gas, as well as putting so much money into the world's highest rate of incarceration. Individuals, acting on the basis of their beliefs and prejudices, and influenced by others with economic and political power, create and apply laws and systems whose primary effect is to disenfranchise a significant proportion of African Americans.

We don't know for sure how to foster exactly the capabilities that will be needed for devising just and efficient political institutions, supporting innovation where it is most needed, or making intelligent consumption decisions, but we do know some of what works against such development.

In the case of water, we have seen the advertising industry create a desire for designer water, diverting resources and distracting attention away from what it takes to provide clean, safe water for all essential uses.

In the politics of corporate welfare in the United States, or our appalling incarceration system, or the corporate interests lobbying against the defense of ecosystem health, we witness a political system wherein big money has made use of individual anxieties about status – including a wish to keep a portion of the population that can be looked down on by the rest – to create coalitions that conspire to turn conspiracy theories into political results.

And what about all those storage facilities full of things people thought they wanted? The creation of desires is the job of the advertising industry, which spends over \$400 billion each year in the U.S. alone to keep us in a perpetual state of dissatisfaction by making us believe, to paraphrase Dana Meadows, that we can satisfy immaterial needs and wants with material things; persuading us that having can take the place of doing and being.

As we attempt to bootstrap human capabilities to the level required to address the challenges of the twenty-first century we face constraints that will force us to question how we use the resources we do have, but may steer us to bad answers to those questions. Homer-Dixon notes that “Severe scarcity often shortens society's time horizons and thereby shifts . . . investment from long-term adaptation to immediate tasks of scarcity management and mitigation.” He also warns about the constraint of “science's vulnerability to the social turmoil that scarcity can cause.” (*Op cit* p. 604). Governments pinched by a recession that will be with us for a very long time choose between universities or prisons; between environmental protection or attracting industries that promise more private sector jobs; between day care or tax cuts. Weighing in to these decisions are the counter forces that make it hard for people to see clearly where their true interests lie. The misinformation that is purveyed through the forces of advertising and political jockeying is, I believe, the greatest danger we face.

We do need new technologies, and the people who can devise and apply them. But most of all we need a change in culture, away from consumerism and economic growth as the highest values. What is required by the challenges ahead is a population who have received the kinds of care, including nutrition, early in life, and the kinds of formal and informal education, that result in a feeling of basic security, not easily prone to hatred or obsessed with symbols of success – who understand how to assess the truth of an assertion, where to look for facts, how to figure out solutions to problems – who are able to decide for themselves what kind of life is really pleasing and what really matters – who care about the future, and about the well-being of others.

Much of the culture we live in has been determined by the counter forces against the development of human capabilities. Traditionally the places where a culture is created are homes, schools, religious settings, and communities. These are all being invaded by advertising and other forms of commercialization. Among the first things that needs to happen is to get advertisements out of schools, while creating curricula that teach children how to understand commercial manipulation. A little of such inoculation can be remarkably effective. Another simple move is to put into pediatricians' offices straightforward information on the effects of having a TV in a child's bedroom. The Boston-based Campaign for a Commercial-Free Childhood is an organization that has been doing good work in both of these areas. Head Start is another program with demonstrably positive effects; you can't reasonably ask over-stressed parents to reduce TV in their children's lives if they have no alternative.

The United States sometimes presents itself as being child-centered: turning that boast into a reality will require more than Head Start and the Campaign for a Commercial-Free Childhood. It will require much more pre-natal support, and a variety of kinds of support for parents. It will require a renewed focus on children, not as consumers but as future citizens.

The children alive now and those born in the near future will create the culture and values required for a sustainable future. The nurturance of their capabilities should be our highest priority. The future would begin to look much brighter if every nation set as its goal that each generation of children should include a smaller absolute number (and percentage) of children who have suffered abuse and neglect, and a larger number (and percentage) of children who grow up enabled to develop their mental, physical and moral capabilities.

There are many uncertainties about how the realities of resource constraints will play out in the lives of our children and grandchildren. In my earlier list of three options, there were two scenarios that could support well-being: one is to accept that lower labor productivity means lower hourly wages, recognizing the society-wide requirement to trim the size of the economy to fit within a finite ecosystem. The other is to find ways to produce the same (or greater) quality of the desired outputs, with less inputs of resources and less labor hours. Both of these offer the possibility that work hours could be decreased. We should probably be bending our efforts toward achieving some combination of these scenarios, in order to avoid the worst one, in which labor hours are increased in order to make up for declining wages.

A society that works to combine advances in materials-, energy-, and labor-saving technologies with strong development of human capabilities will still need to address the following questions:

- Can any production systems manage, as the technological optimists expect, to offer good living environments, nutritious food and clean water – as well as oral hygiene and other desirable outcomes – within the limits of the sink and source capabilities of the earth?
- If producers can “do better with less” will this be by using more human labor – or less? Will the current trend continue, of offering too much work for some people, too little for others, or will we find solutions that allow desirable amounts of leisure for all?
- How much of the work in a desirable future will be in paid jobs – and how much in livelihoods that are different from the formal, paid norm of the present?
- Who will do the unpaid, home or care-related work that is the foundation for human well-being and for the development of human capabilities; and how will the livelihoods of these workers be assured?

Whatever the answers to these question, central to any possible good solution to the dilemmas we face is the development of human capabilities – and of a culture that respects knowledge, fairness and care.

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