

The End of Economic Growth

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Preservation



Institute

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The Limits of Human Needs

Before the industrial revolution, the typical standard of living had changed little through history. Some times were more prosperous than others, but every society devoted most of its economy to producing food, clothing and shelter—the bare essentials needed for subsistence.

The industrial revolution brought sustained economic growth for the first time. Today, the United States and the other developed nations have affluent economies, with only a small fraction of their output devoted to subsistence.

If growth continues, the world economy will become affluent relatively soon. As we will see, per capita Gross World Product (GWP) grew by more than 2 percent annually between 1950 and 2000. Projecting this growth rate, we find that:

- Before the middle of the twenty-first century, per capita GWP will be higher than America's per capita Gross Domestic Product (GDP) was in the 1960s.
- Before the end of the century, per capita GWP will be higher than America's per capita GDP is today.

If economic growth continues, the world could become affluent during the twenty-first century, as the United States and Western Europe became affluent during the twentieth century. But ecological constraints threaten to stop growth. Global warming has already begun and could cause substantial damage by the end of the century. The age of cheap oil seems to be ending, and there are predictions that petroleum production will peak and begin to decline soon, causing prices to soar.

We often hear that we are reaching the limits of growth because of ecological constraints, but we rarely hear that we are also reaching the limits of human needs. Many Americans have become disillusioned with economic growth during the last few decades, not only because of the environmental problems it causes but also because the rising standard of living seems to bring diminishing satisfaction.

We need to ask when growth should end because people have enough. Policies to deal with ecological problems can be successful only if we also develop economic policies that recognize the limits of human needs.

“Growth is no longer improving the average American's well being.”

Affluence and Its Discontents

In the United States, we have already gone beyond the limits of human needs. Growth is no longer improving the average American's well being.

As we will see, the amount Americans spend on health care has soared during the past few decades, but studies show that one third of all of medical procedures are useless.

The amount we spend on education has more than doubled during the past few decades, but studies show that there is no correlation between how much schools spend and how much students learn. The amount we spend on low-density suburban housing and on automobiles increases every year, but suburban sprawl is making our cities less livable.

The average American is more than twice as prosperous now as in 1965. Our per capita Gross Domestic Product and our per capita personal consumption expenditures have more than doubled since 1965, after correcting for inflation (Figure 1). Yet most Americans do not feel better off today, even in purely material terms, than we did in the 1960s.

“The average American is more than twice as prosperous now as in 1965.”

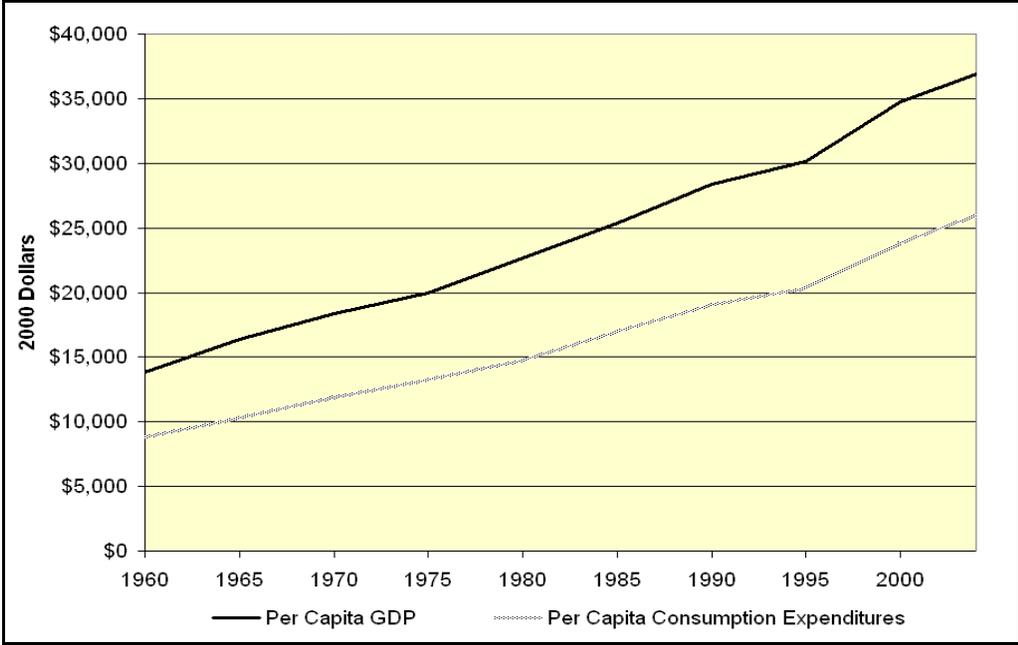


Figure 1: American GDP and Personal Consumption Per Capita¹

Around 1960, there was a flood of books about America’s extravagant wealth: Vance Packard’s *The Waste Makers*, John Kenneth Galbraith’s *The Affluent Society* and David Riesman’s *Abundance for What?*,² to mention just a few. Auto makers were building oversized cars with tail-fins, and economists agreed that we had to promote this sort of wasteful spending to absorb consumers’ excess purchasing power.

Today, Americans feel more pressed economically than we did then. Most families feel that they need two incomes just to get by. They feel they could not survive if they cut back to their family income to the level of the “affluent” 1960s.

Recent studies have developed indexes that measure America’s economic well being, correcting the GDP by subtracting money that we spend to cope with growth, such as the cost of pollution control technologies, and by subtracting the money value of environmental costs that we live with, such as noise. The two major studies of America’s economy found that growth increased our well being through the 1960s or 1970s, and then growth began to reduce our well being:

- **Index of Sustainable Economic Welfare:** This index corrects the Gross National Product by subtracting the estimated money value of resource depletion and environmental damage and also subtracting extra spending on health care, education, commuting, and urbanization that is necessary only to support growth (which economists call “defensive expenditures”). It also corrects for the value of housework, for unequal income distribution, and for several other categories. According to this index, Americans’ economic well being increased substantially during the 1950s and 1960s, leveled off from 1968 until the end of the 1970s, and declined after 1980.³
- **The Genuine Progress Indicator:** This index, compiled by an organization named Redefining Progress, makes even more extensive corrections to the Gross Domestic Product. It shows that America’s per capita GDP has risen steadily during the last fifty years, but our actual economic well being rose until the early 1970s, then began to decline.⁴

Counterproductive Growth

Ivan Illich was the first to talk about the “counterproductivity”⁵ of growth, to say that we have reached a point where economic growth is decreasing our well being. In this study, we will look at the fundamental economic cause of counterproductivity: growth brings diminishing benefits and undiminished social and environmental costs.

As people become more prosperous, they move from buying necessities to buying conveniences to buying luxuries. Eventually, they reach a point where consuming more brings trivial benefits. At this point, the basic food that people buy is still necessary, most products that they buy are still useful, but these final “improvements” in their standard of living do not increase their well being significantly.

Yet growth creates the same social and environmental costs, whether or not the products are useful. A power plant causes the same environmental problems, whether the energy is needed for something useful, such as lighting your home, or for something virtually useless, such as an electric can opener. A downtown office building generates the same traffic and congestion, whether the businesses in it are producing housing or producing throw-away packaging. A gasoline engine consumes resources and creates pollution, whether it is used by a farmer driving a tractor to produce food or by a commuter driving an oversized SUV to work.

At low income levels, the products’ benefits outweigh the problems they create: it is better to tolerate pollution than to do without lighting, housing, or food. But as the economy keeps growing, we reach a point where the last, additional product provides benefits that are less than the problems it creates: it is not worth causing energy shortages and changing the world’s climate in order to drive an oversized SUV rather than a smaller car.

The costs of growth depend on the technology that is used. For example, environmental costs would be reduced if we switched from fossil fuels to solar energy. We can deliberately adopt policies to reduce the costs of growth in the future.

“Growth brings diminishing benefits and undiminished social and environmental costs.”

But today, counterproductivity is pervasive in our economy. In the next three chapters, we will see that, in the case of health care, education, and neighborhood livability, we have already reached a point where growth brings negligible benefits and creates real problems. The appendix analyzes the economics of counterproductivity graphically.

Health Care at the Limit

During the last fifty years, American spending on health care has soared. But life expectancy is increasing much more slowly than it did in the early twentieth century. Spending more on health care no longer brings much benefit, but affluence has become a major threat to health, as Americans eat more fast food, become less active physically, and face an epidemic of obesity. It is widely agreed that the most important things Americans can do to improve our health is to give up cigarette smoking, to eat better diets, and to exercise—not to spend more on health care.

Consuming More Medical Care

America's health-care spending has increased from 5.1 percent of the GDP in 1960 to 8 percent of the GDP in 1975 to 15.4 percent of the GDP today. This is a tremendous increase, considering that per capita GDP itself has more than doubled since 1960. And spending is expected to continue to grow at this pace, climbing to 18.7 percent of the GDP by 2014.⁶

By the 1970s, social critics were saying that many of our common medical treatments are useless.

Americans consider it substandard to be born at home—by the 1960s, virtually all of our births occurred in hospitals—but studies have shown that home births, attended by lay midwives whose training was a year of apprenticeship, have fewer complications than hospital births, attended by teams of highly trained doctors and nurses. Because hospital births are organized around doctors' schedules, there is pressure to shorten labor. Midwives, precisely because they cost less, can have more patience with the natural process of birth, and they are more successful than hospitals in cases where prenatal examination shows that birth will proceed without complications.⁷

Americans also consider it substandard to die at home. They die in hospitals, surrounded by tubes, doctors, and technicians, rather than at home, surrounded by friends and family. Often there is no treatment that will lengthen useful life: the hospitals are filled with machines whose main function is to maintain life in a vegetable state after all hope of recovery is gone.

And there are useless—or harmful—medical treatments from cradle to grave. During the post-war decades, two treatments became notorious:

- **Tonsillectomies:** Doctors got into the habit of pulling out a patient's tonsils at the first sign of trouble. In one experiment, physicians recommended tonsillectomies for about 45 percent of eleven-year olds, regardless of whether they had been found free of infection in either one, two or three previous

“Spending more on health care no longer brings much benefit, but affluence has become a major threat to health, as Americans eat more fast food, become less active physically, and face an epidemic of obesity.”

examinations.⁸ In the 1970s, it was estimated that 90 percent of all tonsillectomies were unnecessary.

- **Overuse of X-Rays:** Even worse, doctors in post-war America routinely used X-rays in their regular checkups of young children. These have little diagnostic value, but they do cause cancer.

These two classic examples of overtreatment were controlled after they became notorious, but other unnecessary treatments have proliferated.

During the 1980s, RAND Corporation studies developed a consensus among doctors about when certain medical procedures were necessary, and then looked at thousands of case records to see how many inappropriate procedures were performed. Later, Value Health Sciences, which included some members of the RAND research team, did more extensive studies of some high-volume procedures. All of these studies ignored cost and called a procedure inappropriate only if its benefit to the patient was outweighed by its risk to the patient. Some of their findings:

- The RAND Corporation found that 32 percent of operations to remove atherosclerotic plaque from the carotid artery of elderly patients were inappropriate.
- Value Health Sciences found that about 50 percent of all Caesarean sections were inappropriate. This is the most common surgery in the United States, accounting for about one birth in four. American obstetricians routinely perform Caesarean sections for “prolonged labor”—which usually means that they are done to save the doctor’s time. Hospitals that have deliberately tried to avoid unnecessary Cesarean sections have cut the rate by at least half, with no added risk to mothers or babies.
- Value Health Sciences found that 27 percent of all hysterectomies were inappropriate. This is the second most common major surgical procedure in the United States. Gynecologists regularly recommend hysterectomies for fibroids, uterine prolapse, and heavy bleeding, though there are less dangerous treatments for all of these.

“There are useless - or harmful - medical treatments from cradle to grave.”

These medical procedures actually harm the health of the average patient. Many other treatments are costly but useless.

For example, specialists have become more common than family practitioners in the United States. Today, about two-thirds of American doctors are specialists, compared with about half in other industrial nations. Specialists earn much more than primary-care doctors. Yet studies show that specialists put more patients into the hospitals, prescribe more drugs, and perform more tests, but that general practitioners are just as successful in protecting their patients’ health.

Dr. John Wennberg, a professor at Dartmouth Medical School, has found that there are tremendous variations in the use of medical procedures in nearby areas, without any benefit to the locations that spend more. For example, he found that about 70 percent of the children who grew up in Stowe, Vermont, had tonsillectomies by the time they were 15 years old, but only 10 percent of the children who grew up in Waterbury, Vermont, had tonsillectomies by that age. About 50 percent of men in Portland, Maine, had prostate surgery by age 85, but only about 10 percent of the men

in Bangor, Maine, had prostate surgery by that age. Twice as many people had heart surgery in Des Moines, Iowa, as in Iowa City. Because of different medical cultures, doctors in some towns recommended these procedures much more often than doctors in others. Yet in each case, Wennberg found that—except for extremely poor areas, where people lack basic health care—high-use areas had no better health than low-use areas.

Another team from Dartmouth University, led by professor of medicine Elliot Fisher, found that Medicare spending varied dramatically through the nation without improved outcomes. For example, Fisher found that hospitals in Sacramento, Ca. spend \$34,659 per Medicare patient, while hospitals in Los Angeles, Ca, spend \$58,480 per Medicare patient with no better result.⁹ In fact, he found that, nationwide, mortality is 2 percent to 5 percent higher in regions that spend more, presumably because medical procedures can cause some risk of death even when they provide no benefit. This study led Fisher to conclude that about one-third of America’s current medical spending goes to services that do not improve health and that may damage health.¹⁰

Differences among industrialized nations are as dramatic as differences within the United States. America spends more than twice as much per capita on health care as the average for other industrialized nations, but has lower life expectancy than the other industrial nations (Figure 2). We clearly have reached a point where spending more on health care is not as important as other factors.

	Spending Per Capita (2003 US Dollars)	Average Life Expectancy At Birth
United States	\$5,711	78
Other Industrial Nations	\$2,789	80

Figure 2: Medical Spending and Life Expectancy in Industrial Nations¹¹

“America spends more than twice as much per capita on health care as other industrialized nations, but has lower life expectancy.”

When we compare all the nations that are members of the World Health Organization (WHO), it is clear that higher health care spending stops increasing life expectancy significantly when spending is over \$1,600 per capita, far less than one third of the United States’ \$5,711 per capita (Figure 3).

Studies that look at individual procedures to see which are unnecessary have estimated that one-third of American health care spending is wasted, but international comparisons imply that two-thirds of this spending is wasted. Yet this waste is happening at a time when many Americans have no insurance coverage at all—which means that those who do have insurance waste an even higher proportion of what they spend.

“Higher health care spending stops increasing life expectancy when spending is over \$1,600 per capita, far less than one third of the United States’ \$5,711 per capita.”

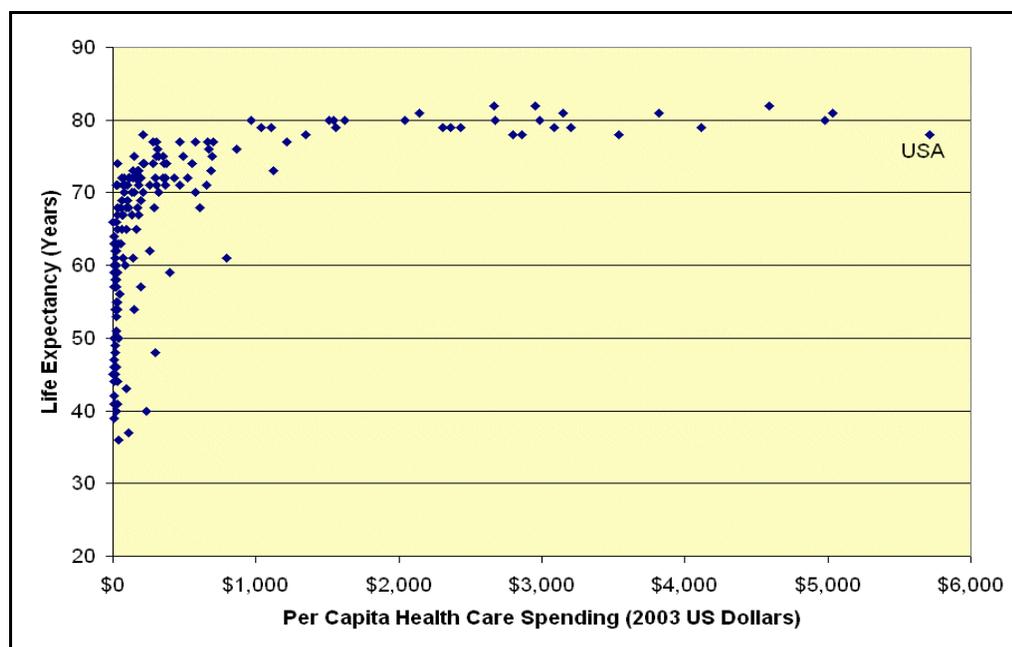


Figure 3: Medical Spending and Life Expectancy of WHO Member Nations¹²

Counterproductivity and Health

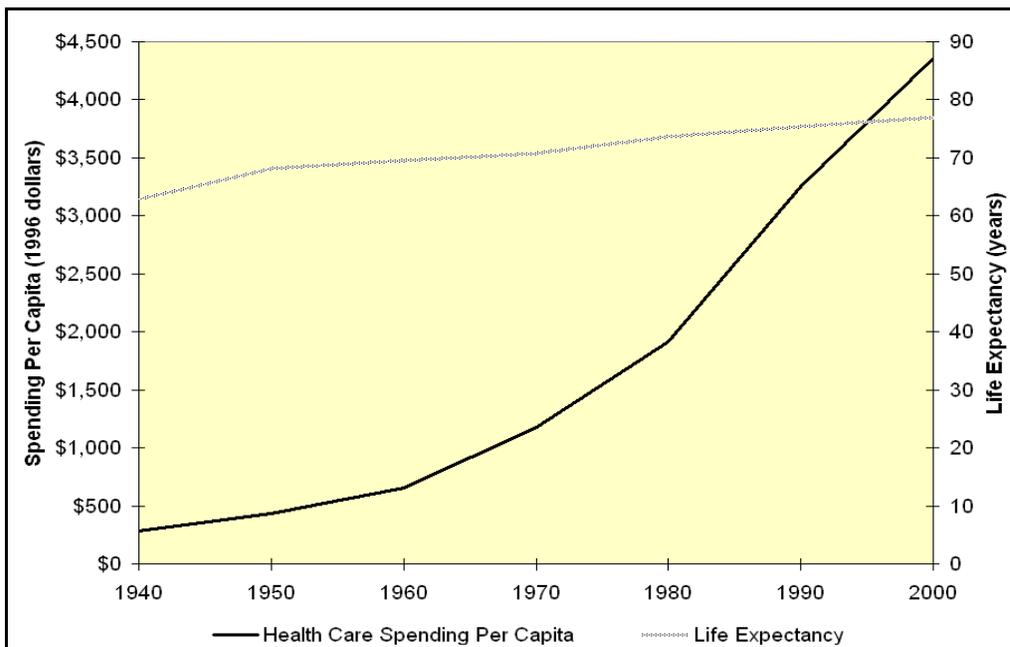
During the early twentieth century, life expectancy increased dramatically because of better living standards and medical care: American life expectancy was only 47.8 years in 1900 and reached 68.2 years in 1950s, increasing more than 21 years during the first half of the twentieth century. During the late twentieth century, increases slowed.

Why did the increase in life expectancy slow dramatically during the late 1950s and 1960s, a time of fast economic growth and even faster growth in health-care spending? Why does the United States have lower life expectancy than other industrial nations, which spend less than half as much on health care? This is a perfect example of counterproductivity.

By the 1960s, we had reached a point where more spending brought insignificant benefits. Much medical care is still needed, but since the 1960s, much of the *growth* in medical spending has gone to *extra* treatments that are useless or even harmful—like the ones described above. There have been technological breakthroughs that have developed useful new treatments, such as coronary bypass surgery and use of statins to reduce cholesterol, but it is not useful simply to spend more money on more treatments.

The same is true of the rising standard of living. Health improved over the past centuries largely because of the improved background conditions that economic growth made possible: better sanitation, housing, and nutrition. By the 1960s, though, improvements in these background factors had also become useless or even harmful. For example, higher food production and better diets helped to improve health over the past centuries, but after Americans were able to afford a good diet, *further*

increases in food production during the past few decades have actually harmed the average American's health, because we consume too much meat and snack foods.



“Life expectancy almost stopped increasing during the late 1950s and 1960s, a time of fast economic growth and even faster growth in health-care spending.”

Figure 4: Medical Spending and Life Expectancy in the United States¹³

An international comparison (Figure 5) shows that a rising standard of living stops increasing life expectancy when per capita GDP is over \$18,000, about half of America's per capita GDP of \$36,924.

Though it no longer brings health benefits, economic growth now causes threats to health that are very real. Today's most common diseases—such as heart disease, cancer, obesity, hypertension, and diabetes—are the by-products of economic “progress.”

The greatest cause of death in the United States is heart disease, which increased by 2000 percent between 1930 and 1960, before it stabilized and began falling. It is caused primarily by cigarette smoking, lack of exercise (as walking has almost disappeared as a form of transportation) and diets based on high-fat fast foods and processed foods.

The second greatest cause of death is cancer. For decades, everyone thought that we could find a cure for this disease if we spent enough on research and development. In 1971, Richard Nixon declared that “the time has come when the same kind of concentrated effort which split the atom and took men to the moon should be turned toward conquering this dread disease,” and Congress allocated \$2.7 billion to the National Cancer Program. Yet most scientists now agree that this program's main achievement was to show that cancer is less a medical problem than an environmental problem, caused by carcinogens in tobacco, air, water, food, and workplaces. Cigarette smoking and modern technology itself are the prime causes of this disease.

“A rising standard of living stops increasing life expectancy when per capita GDP is more than half of America’s per capita GDP.”

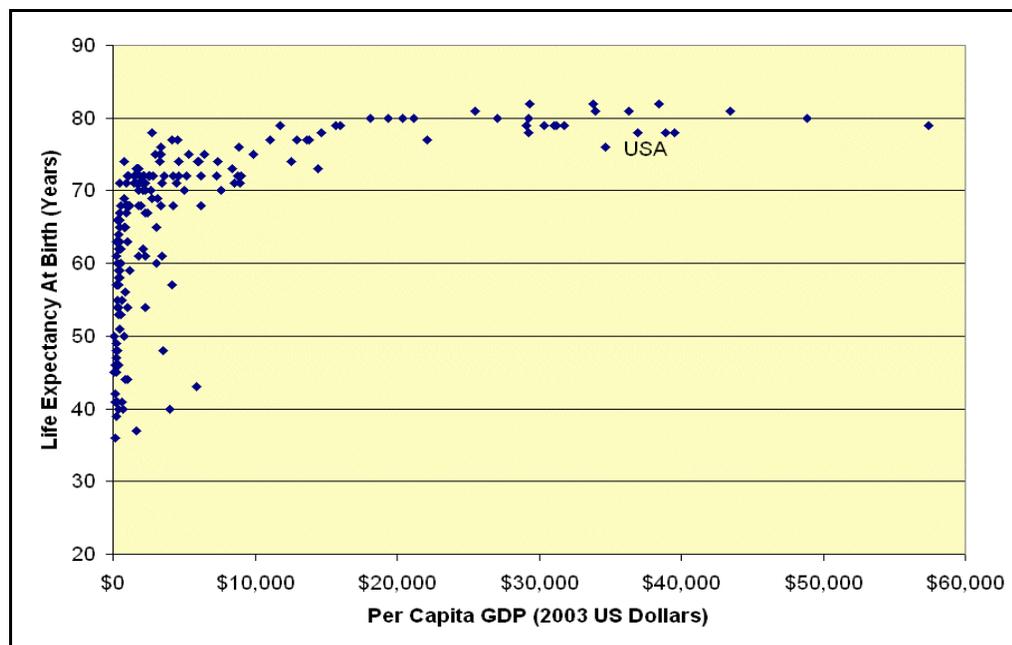


Figure 5: Per Capita GDP and Life Expectancy¹⁴

The third major cause of death is strokes, with similar causes to heart disease: smoking, lack of exercise, and unhealthy diets.

Automobile accidents are the number one cause of death among adolescents and children over one year old.

During the late 1950s and the 1960s, American life expectancy virtually stopped increasing: it rose from 69.6 years in 1955 to 70.2 years in 1965, just .6 year in a decade. The reason is clear: increased medical spending and the rising standard of living were doing little to improve health, but growth had begun to harm health.

In the 1970s, life expectancy began to increase significantly again, from 70.8 years in 1970 to 73.7 years in 1980, almost 3 years in a decade, because there was a sharp drop in deaths from heart disease and strokes. Yet this improvement was not caused by a higher standard of living or by more medical care. The main cause of the decline in deaths was a general trend toward physical fitness: during the 1970s, jogging became a fad and the number of Americans who exercised doubled, better diets pushed down Americans’ blood cholesterol levels by 5 to 10 percent, and middle-aged men smoked 25 percent fewer cigarettes. Heart disease declined during the 1970s because of individual, personal efforts to be physically fit.

In 1979, a Surgeon General’s report looked back at the decade and concluded that Americans could start a “public health revolution” if they changed their habits and diets. One journalist commented that “The report represents an important consensus among doctors and medical scientists. A time has been reached, they say, when people can do far more to improve their health by acting themselves than they can by going to doctors.”¹⁵

In addition, during the 1970s, America adopted strict anti-pollution standards designed specifically to protect health. If we had stuck with the 1950s faith in medical spending and economic growth, rather than making an effort to improve our own health and control the toxic side effects of growth, life expectancy would probably have begun to decline.

More recently, the trend toward physical fitness has waned, and life expectancy now is increasing more slowly than in the 1970s.

Today, the main threat to our health is an epidemic of obesity. In the early 1980s, one out of four Americans was overweight, but today, one out of two is overweight, and 28 percent are obese.

American children are more than three times as likely to be obese today as three decades ago. Many children are now developing type-2 diabetes and high blood pressure, which were virtually unheard of among children a few decades ago. The increase in obesity has outweighed all improvements in children's health, leaving American children today significantly less healthy than in 1975.¹⁶

This increase in child obesity is clearly a by-product of economic "progress," caused by:

- **Less Exercise:** In 1969, 66 percent of American children walked to school. By 2000, only 13 percent walked to school and most were driven to school.¹⁷
- **Less Healthy Diets:** American children eat about five times as much fast food today as in 1970. Almost one-third of American children eat fast food each day, and those who eat fast food consume 187 calories a day more than those who do not, enough to gain an extra 6 pounds per year.¹⁸

Older Americans are less healthy for the same reasons. A recent government study of Americans aged 55 to 64 found that 50 percent have high blood pressure and 39 percent are obese. They are less healthy than Americans of the same age were ten years ago, when 42 percent had high blood pressure and 31 percent were obese.¹⁹ Their life expectancy is still higher than the life expectancy ten years ago, even though their overall health is worse, because they are more likely to use medical treatments that reduce the most common causes of death, such as statins to reduce the risk of heart attack.

Another recent study found that Americans 55 and over are much less healthy than Britons of the same age, even though Britain spends only 40 percent as much per capita on health care as America. Middle-aged and older Americans have much higher rates of diabetes, high blood pressure, heart disease, strokes, lung disease, and cancer than Britons of the same age.²⁰

Jay Olshansky, a professor of public health at the University of Illinois, Chicago, directed a study that projected the effects of obesity on life expectancy into the future which found that the current generation of children will live three to five years less than they would if they were not obese. Based on this study, Olshansky believes the trend toward rising life expectancy will be reversed, and these children will have shorter and less healthy lives than their parents. During childhood, obesity causes relatively little disease, but as these children become middle aged, it will cause

“As today’s children become middle aged, obesity will cause widespread heart attacks, strokes, kidney failure, diabetes, amputations, and earlier death.”

widespread heart attacks, strokes, kidney failure, diabetes, amputations, and earlier death.²¹

Others say that new technologies will continue to increase life expectancy: for example, the biologist Shripad Tuljapurkar says new technologies, such as cancer treatments, could increase life expectancy dramatically beginning in 2010.²²

But even if we do increase life expectancy by developing new technologies to prevent heart disease and cancer, it seems that people will not have the good health that they need to enjoy those extra years of life. We have seen that Americans between 55 and 64 are less healthy now than Americans of the same age were ten years ago, even though new technologies such as statins are still increasing life expectancy. If we do not reverse the trend toward obesity, the current generation of children will be far less healthy when they reach their fifties and sixties, even if new technologies keep them alive despite their poor overall health.

“Americans between 55 and 64 are less healthy now than ten years ago, even though new technologies such as statins are still increasing life expectancy.”

Counterproductivity has already affected America’s health. Though life expectancy is still increasing, studies have shown that American children are less healthy overall than they were three decades ago, and middle-aged Americans are less healthy than they were a decade ago.

The pattern of counterproductivity explains why other industrial nations have better health than the United States. Though they spend less on health care, people in these countries are more likely to walk rather than driving everywhere, and more likely to cook using fresh ingredients rather than eating fast food and processed food. The other industrial nations are healthier than America, because we have reached a point where the amount you spend on health care is much less important than exercise, diet, and other individual actions that improve your own health.

Even Costa Rica, which spends just \$305 per person annually on health care, has almost the same life expectancy as the United States—77 years versus our 78 years. That \$305 is enough to provide very basic health care, much lower quality than America’s. But Costa Ricans smoke only about half as many cigarettes as Americans, Costa Ricans own far fewer cars and walk much more than Americans, and most Costa Ricans still eat a traditional diet of rice, beans, fruit, and vegetables.²³

Education at the Limit

Education is another key example of the failure of growth. Spending on education has soared, but during the 1960s and 1970s, student achievement declined dramatically at the same time as spending increased dramatically. Achievement is still at much lower levels than in the early 1960s, when spending per pupil (after correcting for inflation) was less than half of what it is today.

Since the Coleman Report, published in 1966, the studies have overwhelmingly shown that spending more on education does not improve academic achievement. The quality of schooling has much less effect on achievement than the quality of family and community life.

Academic achievement declined, because spending more on schooling brought negligible benefits, while economic growth brought real costs to the quality of family and community life.

Consuming More Schooling

Spending on education increased dramatically during the twentieth century. Early in the century, educational achievement increased along with increased spending, but since the 1960s, there has been no correlation between increased spending and achievement.

In 1900, only 6 percent of all Americans were high school graduates. During the few years of schooling that they did have, it was common for children to be in classes of 50 students or more. In fact, one Victorian school system, the Lancaster schools started by Joseph Lancaster in early nineteenth century and widely imitated, taught the urban masses with a ratio of one teacher for every 300 to 1000 students by using a monitorial system where some children supervised others.²⁴

In 1920, American schools spent only \$499 per student (in 2001-2002 dollars). In 1950, American schools still spent only \$1,583 per student (in 2001-2002 dollars), a very small amount compared with the \$8,259 per student that we spent in 2001-2002.²⁵ Through the 1950s, increased spending was still needed and still helped to improve achievement.

During the 1960s and early 1970s, spending on education soared, but scores on the SAT plunged after peaking in 1963-64. In part, this was because the pool of test-takers increased, but in 1977, a panel organized by the College Board found that the decline was also caused by lowered expectations, reduced homework, and increasing numbers of non-academic courses.²⁶ In fact, from 1972-1994, there was a 37 percent decline in the number of students who scored above 700 and a 50 percent decline in the number of students who scored above 750 on the SAT; since this is a decline of

“Spending more on schooling brought negligible benefits, while economic growth brought real costs to the quality of family and community life.”

absolute numbers with high scores, not of the percentage with high scores, it cannot be explained by the larger pool of students taking the test.²⁷

As it happened, achievement began to improve during the early 1980s—right after spending on education stopped increasing for a few years because of a severe recession and Reagan’s budgetary cutbacks. Spending began to increase again during the late 1980s, and since that time, achievement has increased and declined without any correlation at all with increased spending (Figure 6).

Overall, per student spending on education today is more than 2.5 times what it was in 1964 (after correcting for inflation). But the students learn less.

“Spending on education soared during the 1960s and early 1970s. Yet scores on standardized tests plummeted.”

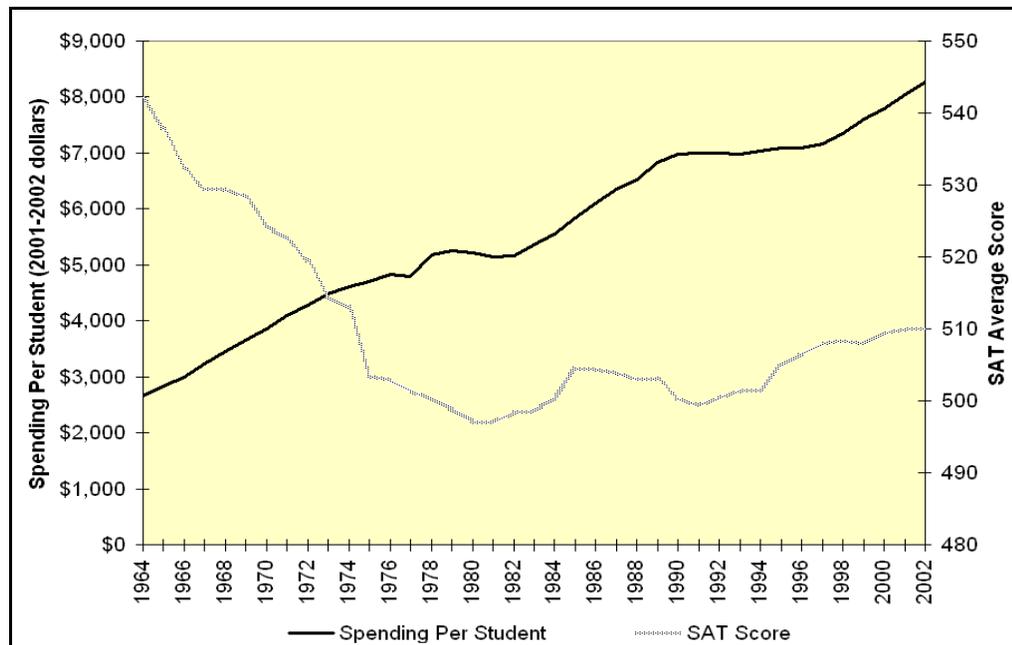


Figure 6: Educational Spending and SAT Scores²⁸

Counterproductivity and Education

Why did educational achievement decline while spending increased? It is a perfect example of counterproductivity. Most American children already got adequate schooling in 1964, and spending more since the 1960s has not improved education significantly. But the growth economy has harmed education significantly: it has overworked parents and left them without enough time for their children, and it has created a consumer culture that works against learning.

Many studies have shown that spending more on schooling no longer improves achievement.

Extensive statistical studies by James Coleman in the 1960s and Christopher Jencks in the 1970s showed that quality of schooling has a very small influence on educational

achievement compared with quality of community and family life.²⁹ A comprehensive review of the literature by Eric Hanushek looked at 187 studies of the effect of spending on educational achievement and found that, in the United States, there is no correlation between academic achievement and the amount of money spent on schooling.³⁰

International comparisons of spending point to the same conclusion: the United States spends far more per student than the average of the other industrial nations, but our reading scores are worse than average (Figure 7).

	Spending per Student (2000 US Dollars)	Average Reading Score of 15 Year Olds
United States	\$7,877	504
Other Industrial Nations	\$5,882	514

Figure 7: Educational Spending and Achievement in the Industrial Nations³¹

“The United States spends far more per student than other industrial nations, but our reading scores are worse.”

We can do a broader international comparison using the scores on the Trends in International Mathematics and Science Study, the most extensive international effort to test for academic achievement. Based on the data available (Figure 8), it seems that increased spending might stop improving achievement at Hungary’s level of spending, well under one-third of the US level, and it seems that increased spending clearly does stop improving achievement at Belgium’s level of spending, well under two-thirds of the US level.

Once you reach these levels, growth of spending may bring small benefits, but they are obviously so small that they are outweighed by other factors.

Though we have reached the point where economic growth does little or nothing to improve education, economic growth does work against education in some obvious ways.

The growth economy requires most parents to work two full-time jobs to support the standard of living. In 1950, the typical family was supported by one parent working 40 hours per week. After women entered the work force, we could have had families where both parents worked 20 hours per week and had free time for their children and for productive activity in their homes and communities. Instead, we have families where both parents work full-time and have no time for their children; more children than ever are cared for by state agencies or are latchkey children in empty homes.

Lawrence Steinberg’s study of over 20,000 High School students in nine communities—by far the most extensive ever done—found that about 25 percent of all High School students have “disengaged parents [who have] ‘checked out’ of child-rearing” completely.³² The children of these disengaged parents are more likely to be emotionally immature, to use drugs, to become delinquent, to suffer from anxiety, depression or psychosomatic complaints, and to be unsuccessful in school.³³

“Increased spending stops improving achievement at one-third to two-thirds of the US level.”

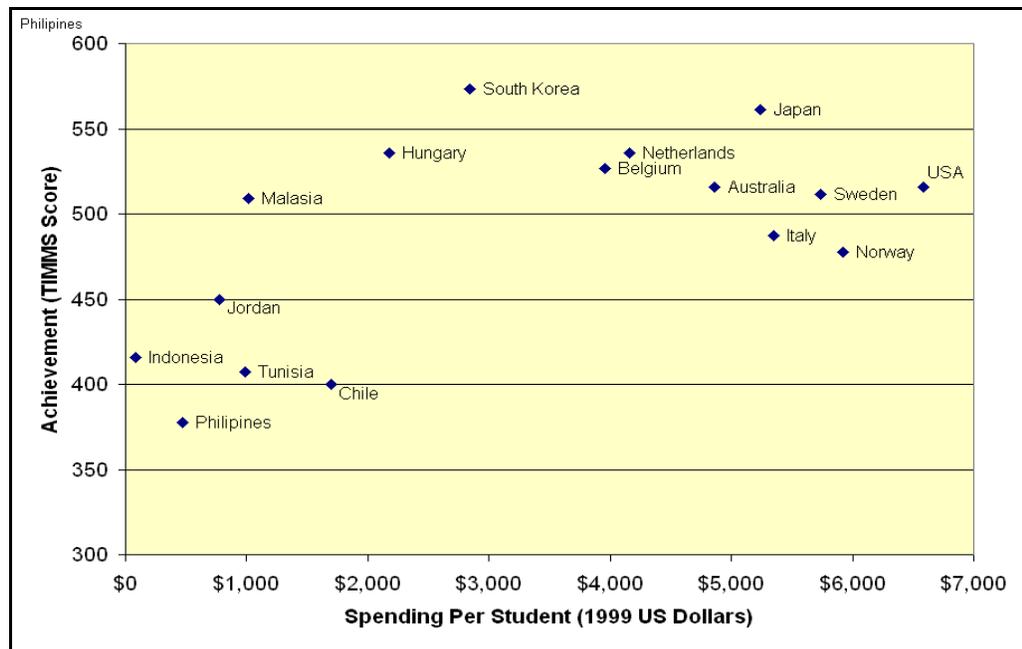


Figure 8: Educational Spending and Achievement Internationally³⁴

The growth economy has also created a consumerist culture that undermines character traits that are essential to learning.

Recently, the high school in San Ramon, California, adopted a rule forbidding students to bring iPods to school. The students organized a letter writing campaign to protest the ban, and a flood of letters to the editor complained that it was unthinkable to ban iPods from campus and to expect the students to go through the entire day without any entertainment.³⁵

Even worse, some teachers say that the children expect them to make the classes entertaining enough to hold their attention. The students think of the teachers as performers, just the opposite of the older idea that the teacher should demand satisfactory performance from the students. These children obviously will not make the effort needed to learn anything difficult. They expect to sit back passively and be educated by their schools, just as they expect to be sit back and be entertained by their televisions and iPods.

This pattern of counterproductivity explains why other industrial nations have higher academic achievement than the United States. Though they spend far less on education, people in these countries work shorter hours and have more time for their children, and children in these countries are less devoted to the culture of consumerism, video games, and entertainment.

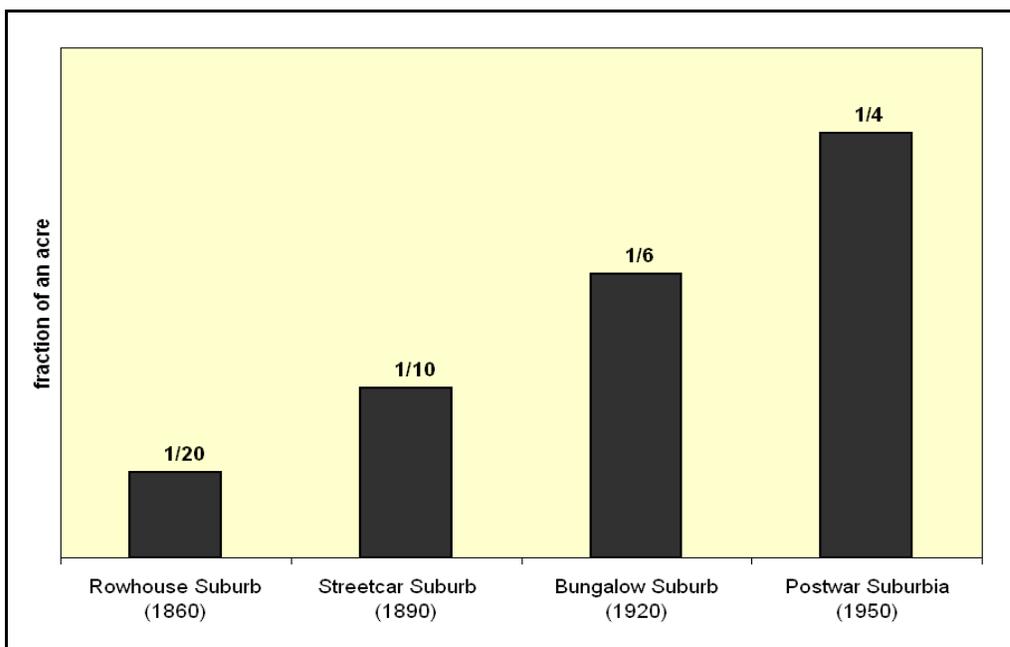
Neighborhoods at the Limit

The history of the American city is another key example of counterproductivity. At first, growth made our neighborhoods more livable, as we moved from walking cities to streetcar suburbs. But during most of the twentieth century, growth made our neighborhoods less livable, as we moved from streetcar suburbs to freeway-oriented sprawl.

Consuming More Housing and Transportation

Before the nineteenth century, all cities were built as “walking cities.”³⁶ Because most people got around by foot, cities had to be very dense. People lived in three to six story buildings, in apartments and in narrow rowhouses, often with shopping on the ground level. Streets were narrow, and buildings were not set back from the sidewalk. The older parts of European cities and towns are still built this way, and some early American cities were just as intense: the streets of eighteenth century Philadelphia looked like the streets of London, though there were vast areas of open land nearby.

Early in the nineteenth century, steam powered ferries and horse-drawn omnibuses let the American middle class live at lower densities. New neighborhoods typically were made up of three-story rowhouses: streets were wider, houses were set back a few feet from the sidewalk and had larger backyards, and trees were planted along the sidewalks. Houses were commonly built on one-twentieth acre lots.



“Post-war suburbia, with housing on one-quarter acre lots, is less livable than the streetcar suburbs built before World War I, with housing on one-tenth acre lots.”

Figure 9: Typical Lot Size in American Middle-Class Neighborhoods

Beginning in the 1870s, horsecars on steel tracks, cable cars, and electric trolley cars let the middle class move to “streetcar suburbs,”³⁷ which we think of today as classic American neighborhoods. They were made up of free-standing houses, with sizable backyards, small front yards, and front porches looking out on tree-lined streets. Houses were commonly built on one-tenth acre lots.

Streetcar suburbs felt spacious and quiet, but their most important form of transportation was still walking—though they were one-tenth the density of the traditional walking city. Streetcars were used for commuting to work and for occasional trips to other parts of town, but everyone lived within walking distance of Main Street or of a neighborhood shopping street. You could catch a streetcar on the main street, but usually you did not need to, because you could find stores, doctors’ offices, and other services right there. People nodded to neighbors sitting on their porches as they walked to the neighborhood shopping street, and they met neighbors at the local stores. A carriage was a sign of wealth one hundred years ago, and (as astounding as it seems today) middle-class Americans who lived in cities, suburbs, or towns did not own vehicles.

Many people like cities, but for those who prefer a suburban way of life, new transportation technology and economic growth brought real benefits during the nineteenth and early twentieth century. From the walking city, to the rowhouse neighborhood, to the streetcar suburb, middle-class neighborhoods became greener, quieter, more spacious, healthier, safer for children.

“During recent decades, we have continued to consume more land every year.”

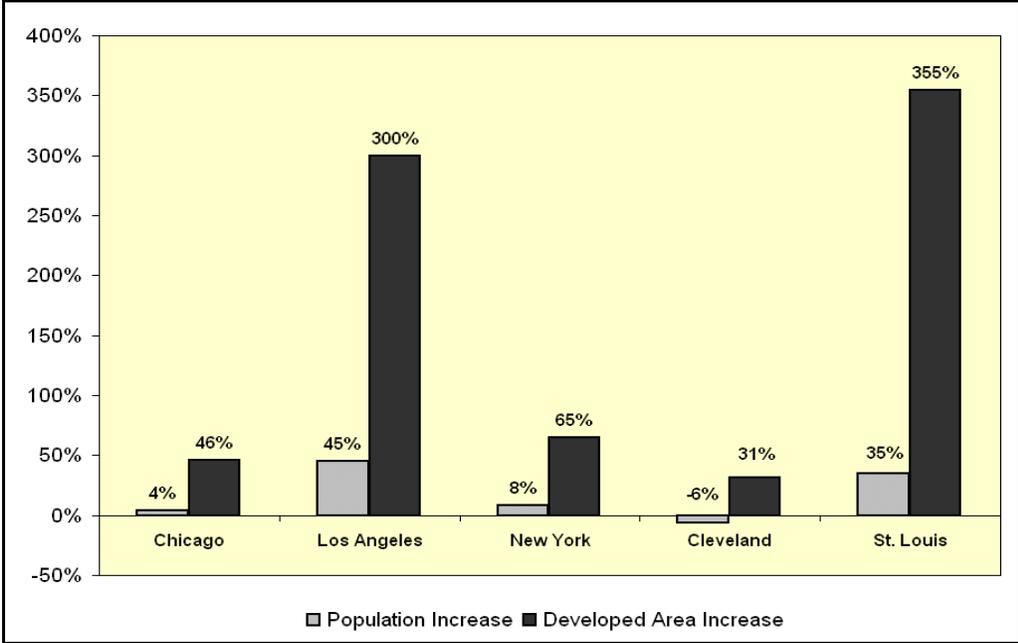
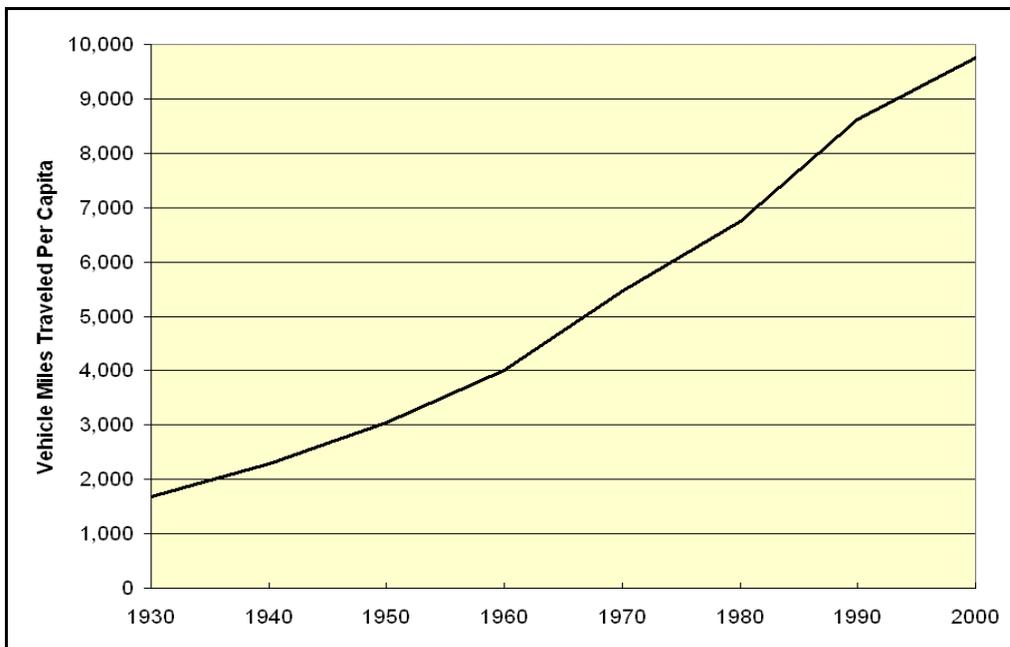


Figure 10: Increase in Population and Developed Land Area in Metropolitan Areas, 1970-1990³⁸

During the twentieth century, Americans moved to even lower density suburbs. After World War I, the typical middle-class neighborhood was a bungalow suburb with one-sixth acre lots: often, the neighborhood stores were not close enough to walk to easily, so people drove a few blocks to buy their groceries. After World War II, when the federal government actively promoted suburbanization to stimulate economic growth,

the typical middle-class neighborhood was a freeway-oriented suburb with homes on quarter-acre lots: to buy groceries, you had to drive on high speed arterial streets, with nerve-racking traffic. During recent decades, we have continued to consume more land and to travel longer distances every year (Figures 10 and 11).



“As speeds have increased, suburbs have sprawled and malls have gotten bigger. People drive further to get to their jobs or go shopping.”

Figure 11: Americans Continue to Drive Longer Distances³⁹

Yet consuming all this extra land and transportation has not made our cities more livable. Excessive automobile use made neighborhoods noisier, more congested, and less safe for children. The countryside that surrounded the early suburbs was replaced by endless freeways, strip malls and tract housing. The sense of community of the early suburbs disappeared, as local shopping streets were replaced by anonymous regional shopping centers.

Counterproductivity and the City

There is no quantitative measure of how livable our neighborhoods are (comparable to life expectancy as a measure of health or achievement tests as a measure of education), but it now is widely believed that growth has made neighborhoods less livable.

Suburban neighborhood groups often organize to stop new development near their homes, because they believe it will lower their quality of life.

The most important trend in urban design in American today is the New Urbanism, a reaction against modern suburbia.⁴⁰ Architects such as Andres Duany and Peter Calthorpe are building neighborhoods modeled on the streetcar suburbs that were built before World War I. Some cities and counties have adopted Traditional Neighborhood

Design zoning ordinances as alternatives to their conventional suburban zoning, so developers are not required by law to build low-density, automobile centered suburbs, as they still are in most of the country.

Post-war suburbia, with housing on one-quarter acre lots, is less livable than streetcar suburbs, with housing on one-tenth acre lots. All the extra land that we consume does not give us more livable neighborhoods.

As growth has made neighborhoods less livable, it has also made transportation less convenient and more stressful.

All the extra money that we spend on transportation—on our freeways and our two or more family cars—does not make it quicker for us to get around. Research has shown that the amount of time that Americans spend commuting to work remained constant from the 1840s, when suburbanization began, through 1990, despite the vast changes in technology during that time.⁴¹ The total amount of time that Americans budget to transportation also tends to remain constant, about 1.1 hours per day.⁴² As speeds have increased, suburbs have sprawled and malls have gotten bigger, and people have driven further to get to their jobs or go shopping.

In Great Britain, the Department of Transport has adopted a guidance document saying that cost-benefit studies on new freeways must assume that elasticity of demand may be as high as 1.0 with respect to speed—that is, time savings can no longer be counted as a benefit of freeway construction, because trip length can increase as much as speed increases.⁴³

After remaining constant for 150 years, the average American's commute time began to increase in the 1990s. The average commute is now 25 minutes, up 18 percent from its historic norm. Almost 10 million Americans drive more than an hour to work, 50 percent more than in 1990, and over 3.4 million Americans drive more than an hour and a half to work, twice as many as in 1990. These "extreme commuters" with a round trip of over three hours a day are the fastest growing group of commuters.

These people generally have to commute long distances to find affordable housing. On the east and west coast, low-density suburban zoning has created such a scarcity of housing that prices have almost tripled in the last twenty years. In southern California, the cost of a house goes down by tens of thousands of dollars for each additional freeway exit that you drive. Real estate agents talk about "Driving till you qualify"—finding a house far enough away that you can afford it.⁴⁴ Because of low-density zoning, these people suffer from the stress of long commutes and do not have enough time to spend with their families; and the nation's most productive farmland, in the Central Valley of California, is being paved over and suburbanized.

When we look at how American neighborhoods have changed historically, the pattern of counterproductivity is clear. Neighborhoods became more livable as the middle class moved from the walking city, to row houses, to streetcar suburbs, but by World War I, middle-class Americans were already living in neighborhoods that were adequate. The streetcar suburbs gave families enough space, enough privacy, enough quiet, a big enough yard. Modern suburbia does not bring much added benefit, but it does cause real social and environmental problems, such as air pollution, automobile accidents, congestion, the ugliness of shopping strips, the loss of farmland and open space, a scarcity of land that drives up housing costs, and the breakdown of

“The streetcar suburbs gave families enough space, enough privacy, enough quiet. Modern suburbia does not bring much added benefit, but it does cause real social and environmental problems”

community as local shopping is replaced by regional malls. We have reached a point where the costs of urban growth outweigh its benefits.

Yet most Americans today have no choice but to live in low-density suburbs, where families need two or more cars. During the post-war period, the federal government actively promoted this sort of development in order to stimulate the economy and create jobs. Today, most zoning laws still require developers to build low-density housing separated from other uses, forcing people to live in neighborhoods where they cannot walk to shopping and other basic services, and they must drive every time they leave the house.

Compulsory Growth or Choice

Much of what we spend on health care, education, suburban housing, and transportation is wasted. But if we eliminated this sort of waste, what would happen to the unemployment rate?

The automobile and suburbia were the mainstays of the post-war American economy. At that time, city planners knew the freeways and suburbs were wasteful, but they considered this a good thing. One of the most authoritative urban planners of the time said we were right to rebuild our cities around the automobile, because “A certain kind of planned waste is healthful for an economy of abundance ... as long as it follows and supports the general tide of growth and progress....”⁴⁵ He speculated that, in the future, when automobile use reached the saturation point, we might resort to helicopters as the new mainstay of economic growth.⁴⁶

“If we eliminated this sort of waste, what would happen to the unemployment rate?”

For many decades, Americans have believed that we need growth, whether or not we are producing anything useful, purely to create more jobs. There is absolute consensus that we need to create jobs: all the politicians promise the voters that they will provide more jobs than their opponents.

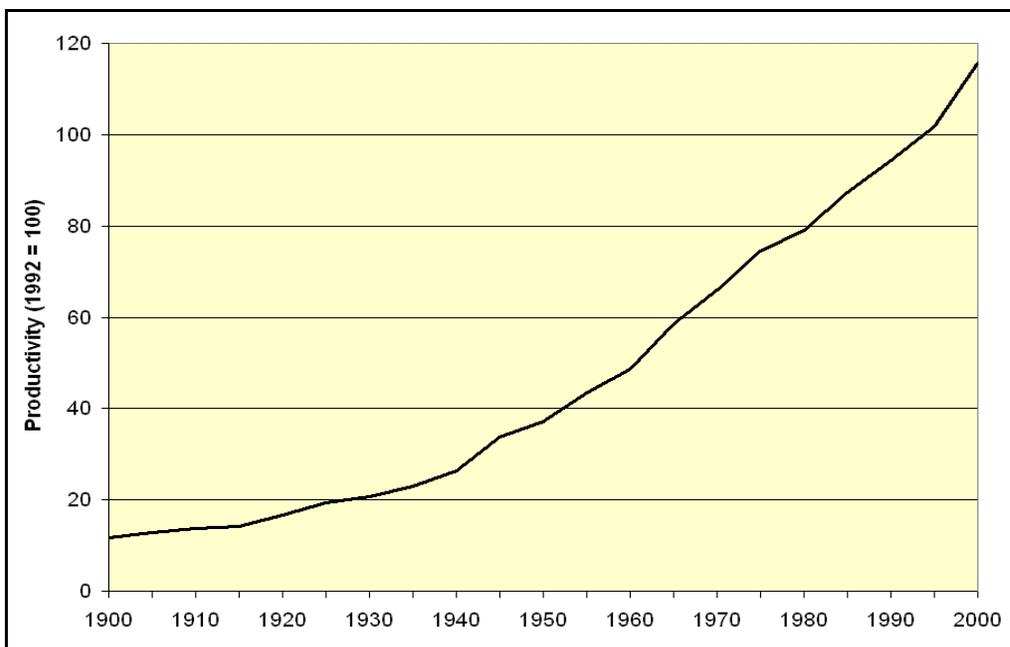
Is growth really needed to combat unemployment, as everyone seems to think? Or can we choose our standard of living?

Technological Unemployment

Economists call the relationship between growth and unemployment “Okun’s law,” which states that an extra percentage point of growth causes about a half percentage point drop in unemployment. Okun’s law is generally taken to mean that, given the current rate of population growth, we need economic growth of at least 3 percent annually just to stop unemployment from rising.

Even if there were no population growth, we would need economic growth rate of over 2 percent to keep unemployment from rising. During the twentieth century, productivity (output per worker hour) increased by just over 2.3 percent per year, increasing almost ten-fold in the course of the century (Figure 12).⁴⁷

According to the conventional wisdom, since better technology lets the average worker produce about 2 percent more per hour each year, the way to keep all the workers employed is by consuming about 2 percent more each year. If we do not consume more, we will be faced with technological unemployment—failure of consumer demand to keep up with the growing productive capacity of new technologies.



“During the twentieth century, productivity increased by just over 2.3 percent per year, increasing almost ten-fold in the course of the century.”

Figure 12 : American Productivity (Output per Worker Hour)⁴⁸

Is it really true that we have to keep producing more and more endlessly, whether or not we want the products, purely to create jobs and avoid unemployment?

Early in the twentieth century, some economists suggested that growth would end when people had all the products they needed or wanted, so they would choose to work shorter hours rather than consuming more. Improved technology did bring shorter work hours at first. Early in the nineteenth century, most people worked twelve hours a day, six days a week. The work week shrank during the nineteenth and early twentieth centuries. The traditional six-day week was shortened to five and a half days during the 1920s and to five days during the 1930s.

During the depression, there was a struggle within the Roosevelt Administration over whether to fight unemployment by reducing work hours or promoting growth. Initially, Roosevelt supported the Black-Connery bill, which would have reduced the work-week to 30 hours. Virtually everyone believed that this bill was just a first step, that work hours would inevitably become even shorter in the future as technology continued to become more efficient. Labor supported this bill, with AFL president William Green in the lead, but business leaders resisted the bill fiercely and said that we should fight unemployment by promoting what they called “the new gospel of consumption.” Because of business opposition, the Roosevelt administration changed its position and, as a compromise, backed the Fair Labor Standards Act, which reduced the work-week to 40 hours—not really a reduction for most workers, since the average work-week had declined to 33 hours because of the Depression. Roosevelt also promised more funding for public works projects to stimulate the economy and provide everyone with a 40-hour job.⁴⁹

In post-war America, this compromise became the conventional wisdom: we had to stimulate the economy to provide everyone with 40-hour jobs. Corporations stepped up their advertising; the federal government funded freeways and suburban

development to stimulate growth; and the average work week leveled off at 40 hours during the post-war period. The long historical trend toward shorter work hours stopped dead during a period of rapid economic growth, rising wages, and widespread affluence.

The best historical statistics are available for the average work-week in manufacturing (Figure 13). The graph shows that work hours declined for almost a century, dropped sharply during the Depression, increased during World War II, and then remained at about 40 hours since the end of the war.

“The long historical trend toward shorter work hours stopped during a period of rapid economic growth, rising wages, and widespread affluence.”

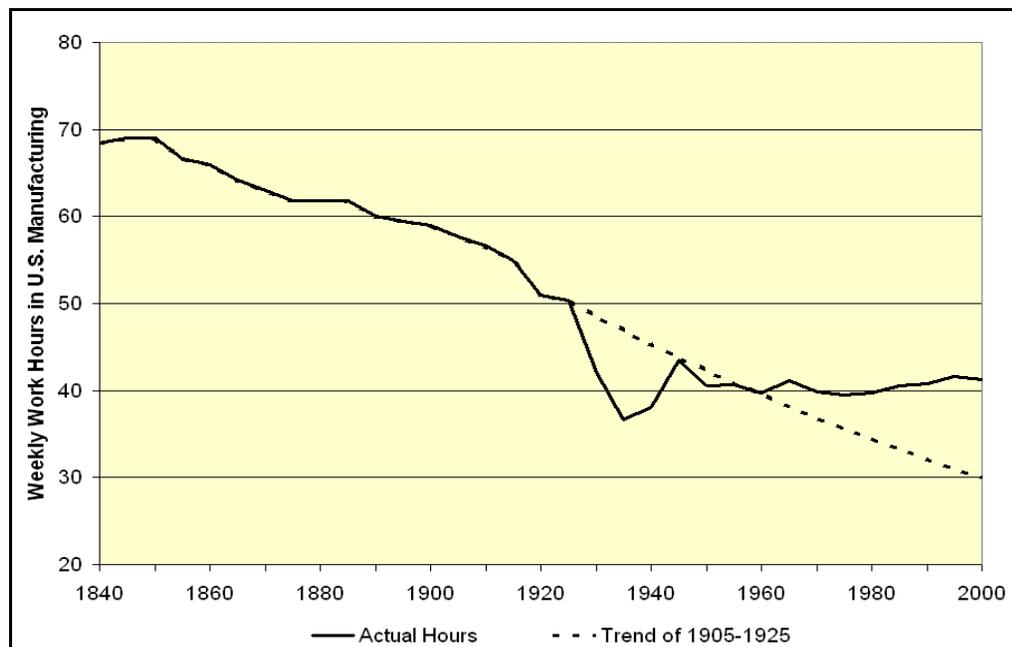


Figure 13: Average Work Week in American Manufacturing⁵⁰

The average work week in the whole economy declined in the late 1960s and 1970s, and it has hovered around 35 hours since 1980, but this is because women entered the workforce *en masse* during the 1960s and 1970s, and many of them wanted part-time jobs. If we correct the average workweek for the rising number of women in the workforce, we find that the total number of hours worked has actually increased since the 1970s. People with full-time salaried jobs are also more likely to work over 40 hours than they were decades ago. The economist Juliet Schor found that, overall, the number of hours that the average American works has increased by more than 10 percent after 1969.⁵¹

We should be able to see that we need growth to fight unemployment only because we have a standard 40-hour workweek that has not changed since the 1930s, despite much greater affluence and a much greater number of two-income families. Even hundreds of years in the future, even if per capita income reached \$10 million per year or \$100 million per year, Okun’s law would still say that we need economic growth to avoid technological unemployment—as long as people have to keep working an unchanging standard work week.

Individual Choice of Living Standard

When we have reached the point where consumers' needs are satiated, how can we end growth without creating technological unemployment? The answer is obvious. As new technology lets the average worker produce more per hour, we can either consume more products or work fewer hours.

Which of these should we do? According to economic theory, we should let each worker choose how many hours to work. If workers choose shorter hours, it is because they get greater satisfaction from more free time than they would get from more income. According to the basic principle of market economics, interfering with individuals' choices between more free time and more income reduces total well being, just as interfering with individuals' choices between two products would reduce total well being by forcing some people to buy the product that gives them less satisfaction.

In today's economy, most people have little or no choice of work hours. Most good jobs are full-time, and most part-time jobs have low wages and no benefits. You can work part-time if you want to flip hamburgers, but if you want to be a factory worker, teacher, engineer or manager, you have to take a standard, full-time job.

Despite the lower pay and lack of benefits, many people want to work part time. Though there are some involuntary part-time workers, the great majority are part-time by choice (Figure 14). Obviously, many more people would work part time, if they could get better wages, benefits, and opportunities for promotion.

In fact, a survey has found that, if only they had the choice, half of American full-time workers would want to give up a day's pay each week in order to get an extra day off each week.⁵²

To optimize total output, we need to let people choose their work hours. Government should offer its employees choice of work hours whenever it is feasible, and there should be tax incentives for businesses to offer part-time jobs and to give full-time workers the choice of working shorter hours. There should be laws that forbid discrimination against part-time workers: employees who do the same work should get the same hourly pay and pro-rated benefits and opportunities for promotions,⁵³ regardless of whether they are full-time or part-time.

The Netherlands has gone further than any other country in opening opportunities for part-time work. During the 1980s, under the agreement of Wassenaar, labor unions moderated their wage demands in exchange for employees providing more part-time jobs, and since then the government and labor unions have actively encouraged part-time work with comparable wages and benefits. The Netherlands also passed a law forbidding discrimination against part-time workers. Because of these policies, the proportion of part-time workers increased from 21 percent in 1983 to 36.5 percent in 1996,⁵⁴ and the average work week for all workers declined to about 28 hours by 1995.⁵⁵

“As new technology lets the average worker produce more per hour, we can either consume more products or work fewer hours.”

“Despite the lower pay and lack of benefits, many people want to work part time.”

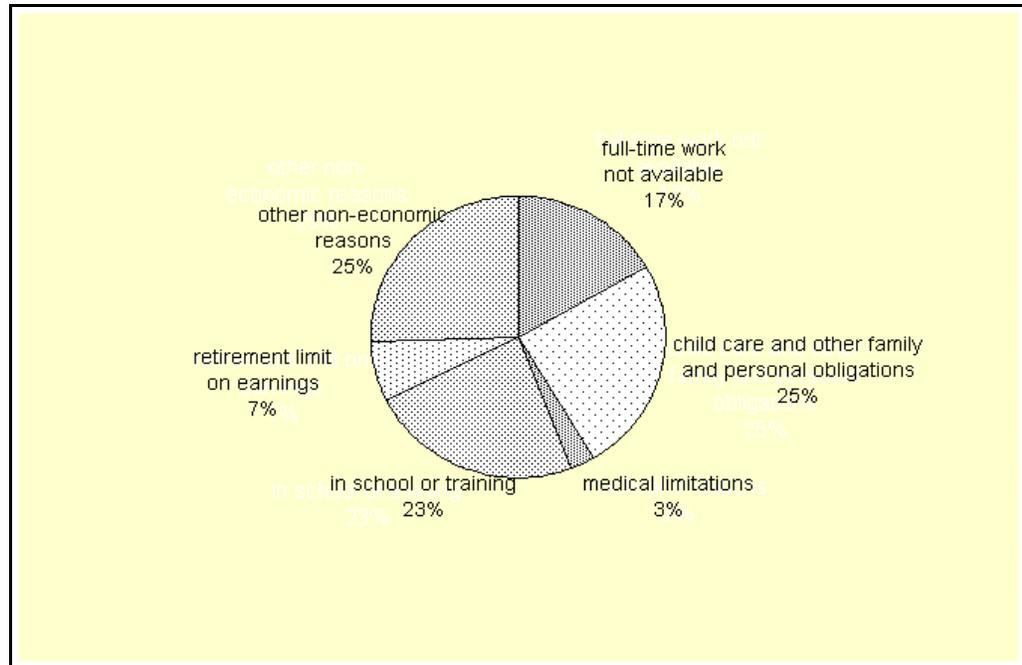


Figure 14: Reasons Americans Work Part Time, 2004⁵⁶

Rudd Lubbers, the Prime Minister when these policies were implemented, has written:

The Dutch are not aiming to maximize gross national product per capita. Rather, we are seeking to attain a high quality of life.... Thus, while the Dutch economy is very efficient per working hour, the number of working hours per citizen is rather limited. ... We like it that way. Needless to say, there is more room for all those important aspects of our lives that are not part of our jobs, for which we are not paid and for which there is never enough time.⁵⁷

The Netherlands has one of the lowest unemployment rates in Europe, and it is attracting attention as a model for work flexibility. The entire European Union has now adopted the Dutch policy banning discrimination against part-time workers, but has not done as much to make part-time jobs available. And the Netherlands has gone a step further by passing a law requiring employers to allow their employees to work shorter hours unless they can prove that it would cause a hardship for the business.⁵⁸

If we adopted similar policies, we could have enough good part-time jobs and jobs with choice of work hours that people would be able to choose how many hours they work on the basis of how much income they need.

Once people could choose their own standard of living, they would begin to think more carefully about how they spend their money. Before buying a McMansion and two family SUVs, people would consider that they could work a day or two less every week if the family had a house in a walkable neighborhood and one car. For the first time, people would have to make a conscious decision about whether they want more money or more free time—and this would be an eye-opening experience for today’s Americans, who do not even have enough time to take care of their own children.

All of these decisions that individuals made about their personal standards of living would determine the total GDP, the standard of living of the country as a whole. If people took productivity gains in the form of shorter work hours rather than in the form of more products, there could be a slow-growth economy or a no-growth economy without higher unemployment.

Rather than promoting growth to provide jobs, whether or not we want the products, people would work enough hours to buy what they wanted, and then stop.

Economic planning would still be needed to fine tune the economy and avoid unemployment. Economists would obviously have to invent new planning techniques to manage the transition to a no-growth economy. But the technical questions that economic planners deal with should be subordinate to the underlying human question of what standard of living we want, which people should decide for themselves.

Economic planners should not promote growth, whether or not people want the products, purely to create extra work. The planners should try to give people the amount of work and the standard of living that they actually want.

“Economic planners should not promote growth, whether or not people want the products, purely to create extra work.”

Political Choice of Living Standard

To end growth, we must also make political choices about the standard of living. If Americans today had the option of working part-time, they might cut their work to four days a week instead of five, but they could not afford to go much further.

Market theory says that individual choice is enough, because it overlooks the consumption that is forced on people. Americans waste half the money they spend on health care, for example, but the insurance companies pay, and people who spend less do not keep the money they save. Most American families own two or more cars, but they live in suburban neighborhoods where every adult needs a car. In order to get out of this trap, we have to act politically to reform health care, to limit sprawl and automobile use, and to end other forms of compulsory consumption.

If people had flexible work hours, they would not only think about whether to buy SUVs or to buy smaller cars and work less. They would also start thinking that, if we built cities where you do not need a car, they could work even less.

Economists who wrote about the end of growth earlier in the century assumed that demand would stop growing automatically if people’s needs were satiated. Liberal economists believed that consumers would eventually begin to choose more leisure rather than more products. Conservative economists believed that people would always want to consume more. Both schools believed that the end of growth depended on individual choices in the market.⁵⁹

But growth cannot end purely as a result of consumer choice: because of market failures, demand will keep growing even after growth becomes counterproductive.

Most important, the market fails to end growth because people continue to consume more if it has any benefit for themselves, however small, regardless of social and environmental costs. They continue to consume more to benefit themselves, even if

“Growth cannot end purely as a result of consumer choice: because of market failures, demand will keep growing even after growth becomes counter-productive.”

the result to society as a whole is a net loss. In the past, we have encouraged this sort of destructive growth to create jobs—through federal policies to promote automobile use and suburban sprawl, for example—but people would choose to do similar things even in a pure market economy.

For example, people drive big SUVs rather than smaller cars, even though the costs to the environment and the overall economy are much greater than the small benefit to themselves.

Likewise, people use jet skis, snowmobiles, and off-road vehicles for recreation, to amuse themselves, even though the noise they make disturbs everyone else's recreation and causes resource depletion, pollution, and destruction of wildlife habitat. Environmentalists believe that these forms of recreation cause more problems than benefits and should be limited.

During the past few decades, the environmental movement has fought against off-road vehicles, resort developments in the wilderness, freeway construction, sprawl development, and other destructive forms of growth. This sort of mass political movement never existed in the past. These issues have become important now because we have reached a point where many things that we consume bring trivial benefits, smaller than their social and environmental costs.

Decisions about these issues have to be made politically. The market does not work, because individuals act on the small benefit to themselves, and they usually disregard environmental and social costs. They often make choices whose net result to society is a loss.

In political battles about these issues, the main argument for growth is that it will create more jobs. If people had choice of work hours, this argument would disappear: people would see that, if we limited destructive forms of consumption, the average person could work shorter hours. The claim that growth creates more jobs really means that growth forces us all to work harder.

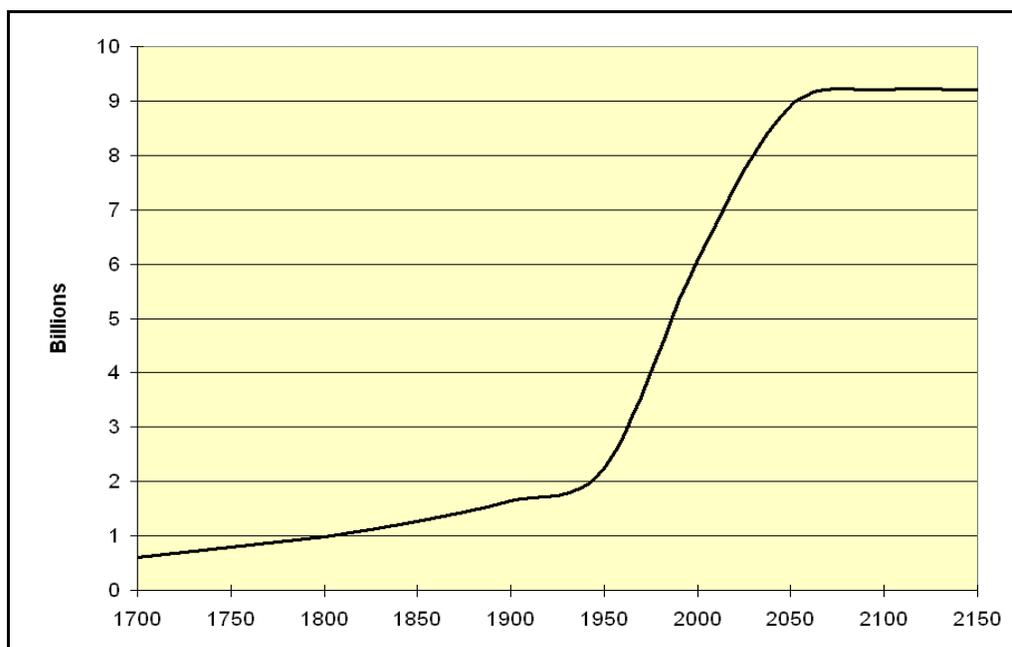
Three Possible Futures

We have seen that America's spending on health care, education, and suburbanization has increased dramatically since the 1960s without bringing any benefit. We have not looked at other examples of waste that are even more obvious, such as the "shop till you drop" culture that makes Americans spend three to four times as many hours shopping as people in Western Europe,⁶⁰ and the \$265 billion annually spent on advertising to persuade Americans to buy things, more than is spent on advertising in the entire rest of the world combined.⁶¹

Before the rest of the world tries to imitate American consumerism, we should consider whether we would be better off if growth ended at a lower income level.

The Economy of the Coming Century

There is a chance of moving to a sustainable economy in the coming century, because population growth will end. According to the United Nations' medium-growth projection, world population will peak in 2075 at about 9.2 billion and then will begin to decline slowly (Figure 15).



“World population will peak in 2075 at about 9.2 billion.”

Figure 15: Historic and Projected World Population⁶²

The United Nations has repeatedly revised its population projections downward, and it is likely that world population will peak at less than the projected 9.2 billion. Because the world population decline after the peak will be unprecedented, it is impossible to

predict, and so this graph simplifies by assuming that population will level off rather than declining.

To see whether the world can move to a sustainable economy, we must also ask how much per capita Gross World Product will grow in the coming century—that is, we must ask how much each of these people will produce and consume.

“Projecting current economic growth rates, we find that per capita production and consumption will reach high levels relatively soon.”

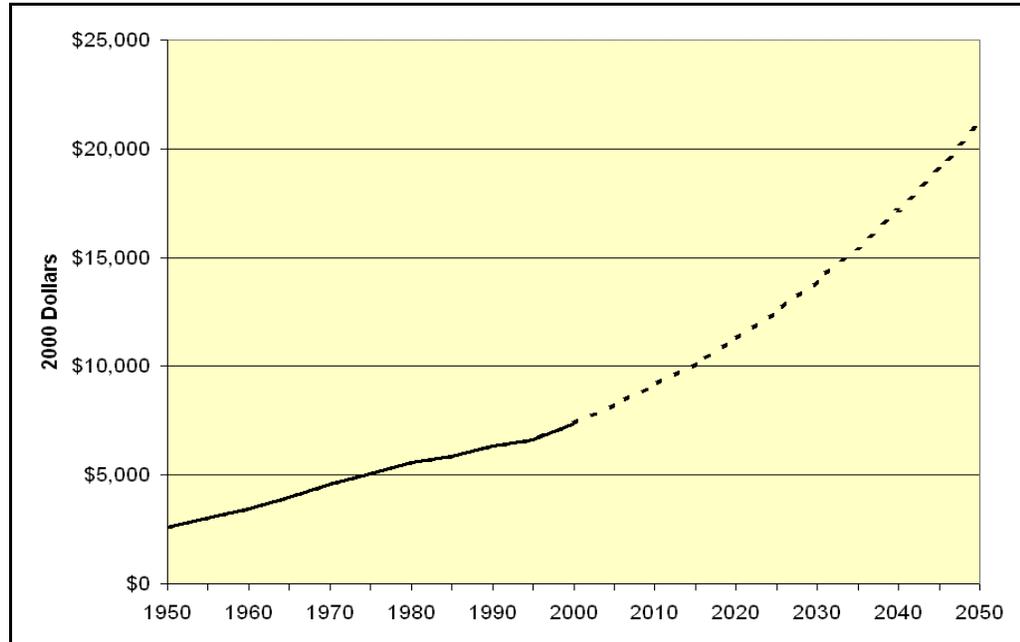


Figure 16: Growth of Per Capita Gross World Product⁶³

Projecting current economic growth rates, we find that per capita production and consumption will reach high levels relatively soon (Figure 16). Between 1950 and 2000, per capita Gross World Product grew at a rate of about 2.1 percent a year. If it continues to grow at this historic rate:

- Per capita Gross World Product will be \$17,147 in 2040, greater than America’s per capita Gross Domestic Product of \$16,420 in 1965.
- Per capita GWP will be \$39,778 in 2080, greater than America’s per capita GDP of \$36,883 in 2004 (all figures in 2000 dollars).

This does not necessarily mean an end to world poverty, because growth and affluence will be distributed unevenly through the world. The developed nations are way above the average, meaning that the developing nations are below the average. Among the developing nations, Asia is growing rapidly and steadily, Latin America is growing more erratically, and Africa is growing slowly.

Nevertheless, if growth continues, affluence will spread to much of the world by the end of the century.

Wages have already reached middle-class levels in Taiwan and Korea. China’s and India’s economies are both growing at a break-neck pace: though their average wages

are still very low, both these countries have rising wages and a rapidly growing middle class. For example, China's streets were clogged with bicycles a couple of decades ago, and they are clogged with cars today.

Much of the developing world is at the stage now where Europe was in the nineteenth century, when workers lived in urban slums where conditions were much worse than they had been in rural subsistence economies. Mexican workers in maquiladora factories live in the same sort of misery as the English workers in Dickens' time.

But wages went up in America and Europe during the twentieth century, because productivity kept growing while slower population growth tightened the labor supply. In the twenty-first century, the same thing could happen to the entire global economy: wages will increase as productivity keeps growing while world population growth slows and peaks. The supply of capital will increase more quickly than the supply of labor, so the share of income that goes to labor will increase.

Wages in Taiwan and South Korea are already so high that they no longer attract labor intensive industries. By the middle of the twenty-first century, wages in China and India could also be high enough that they will also lose their labor intensive industries to countries with lower wages;⁶⁴ but at that point, countries with low wages will start to become scarce, since half of the people in the world will live in countries with middle-class wages. By the end of the twenty-first century, wages could go up to middle-class levels throughout the world as industries move to the remaining low-wage nations—if growth continues, but that is a big if.

This projection of world-wide affluence assumes that ecological problems will not disrupt economic growth. If people decide to consume less and work shorter hours when their wages rise, there is clearly less chance of ecological disruption. If people work shorter hours, labor will also become scarce sooner, and wages will go up more quickly. However, businesses will try to use advertising and government policy to stimulate consumer demand world-wide to maintain their profits. Business won this battle in the United States in the 1930s: they will fight it even more fiercely in the coming century, when the world's future is at stake.

To bring these issues into focus, we will look at three different scenarios for the future of the world economy, where growth ends in widespread economic comfort, growth ends in widespread consumerism, and growth continues indefinitely.

“This projection of world-wide affluence assumes that ecological problems will not disrupt economic growth.”

Scenario 1: Growth Ends in Comfort

First, imagine that people decide they have enough at the economic level of the United States in the 1960s—the time when American social critics began to say that our economy was so affluent that it was geared to waste. Imagine that individuals generally chose more free time rather than more income, and imagine that people also made the political decisions needed to limit sprawl, excessive automobile use, and other forms of destructive consumption, so per capita GWP stops growing when it reaches the level of 1965 America (slightly less than half of America's per capita GDP today).

This income level could let everyone in the world live in middle-class comfort. It is true that in the 1960s, 15 to 20 percent of Americans were poor, and many more did

not share in the country's affluence. But at the same time, the Federal government was building freeways all over the country to stimulate demand, the country was being paved over by suburban sprawl, and the automobile manufacturers were building oversized cars with tail fins to absorb consumer's excess purchasing power.

The same per capita income would be enough to let everyone live well, if people rejected consumerism and shortened their work hours once they were comfortable, rather than moving to sprawl suburbs and buying two cars. Children could all get a good education. Everyone could have all the useful health care that they needed. Families could all own their own homes in streetcar suburbs (though some people and some cultures prefer denser cities and would not want to suburbanize themselves). In this scenario, people would use canoes and sail boats for recreation rather than jet skis and power boats, cars would be an occasional convenience rather than an everyday necessity, and shopping till you drop would not become the world's favorite hobby.

Figure 17 represents this scenario graphically. To give everyone in the world basic middle-class comfort, with the per capita GDP that Americans had in 1965, would require a Gross World Product of just over \$150 trillion (\$16,420 in 2000 dollars times 9.2 billion people). If world economic growth continues at its historic levels, the world will have this GWP in mid-century, before population growth stops completely. Even if reduced economic growth in the developed nations cuts the world's economic growth rate in half, the world will reach this level before the end of the twenty-first century and then move permanently to a no-growth economy.

“To give everyone in the world basic middle-class comfort, Gross World Product would level off at just over \$150 trillion.”

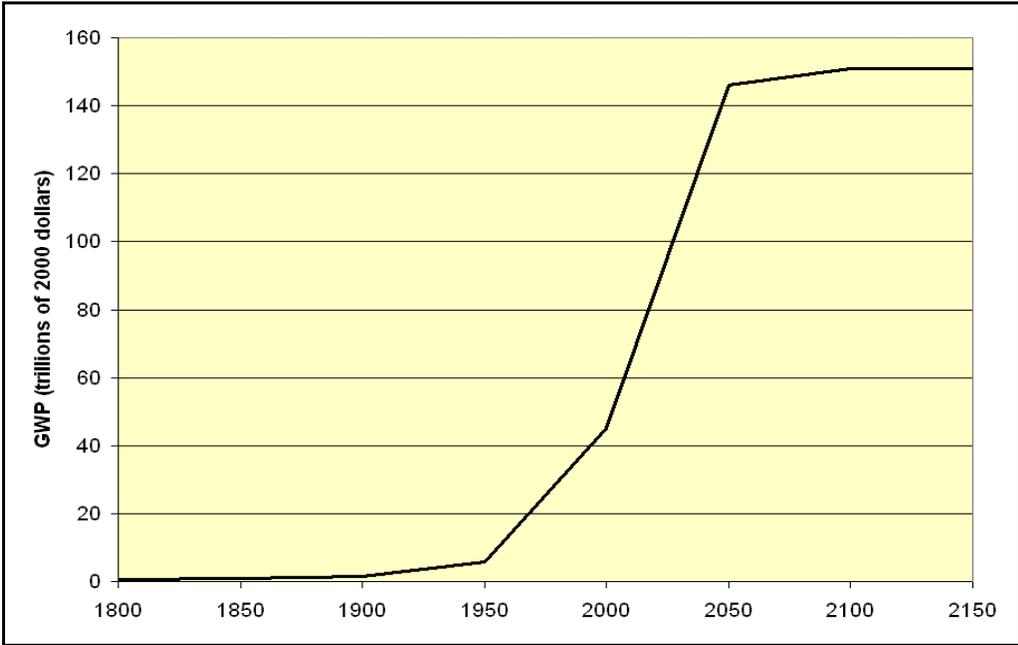


Figure 17: Growth Ends when Income Reaches a Comfortable Level⁶⁵

In this scenario, the United States would need a period of negative economic growth to get our per capita GDP back down to the 1965 level, less than half of what it is today. Except for the poor, people would begin reducing their work hours. They would do less shopping. They would start moving to neighborhoods where you can walk, and they would change transportation policies and zoning laws so more of these

neighborhoods were built. Of course, negative growth would have to be gradual: it would take many decades to rebuild our cities so they were no longer dominated by the automobile, and a gradual transition is also needed to avoid economic instability and to protect retirement funds.

World growth would slow and end as other countries reached this same per capita GDP. At the end of the twenty-first century, people in the poorest parts of the world might still need two full-time incomes to earn this much; but after another century of wage gains, virtually everyone could earn this much by working relatively short hours.

This is not an austere future. When America's per capita GDP reached this level, the nation was calling itself the affluent society. The world could aim at a future with the same affluence and with much more free time, making them better off than Americans were in the 1960s.

In this scenario, we would still have to solve many technical problems to make the world economy sustainable, but they would not be insurmountable if there were a strong effort to design non-polluting manufacturing processes, to redesign products so they could be fully recycled, and to shift to renewable sources of energy such as solar power. We would have to increase resource efficiency almost four-fold to produce a Gross World Product of \$150 trillion per year sustainably, and there is evidence that this is possible.⁶⁶

“To let everyone live in the consumerist style, Gross World Product would level off at just over \$600 trillion.”

Scenario 2: Growth Ends in Consumerism

As a second scenario, imagine that the world imitates the current American consumerist style, so growth does not end until everyone in the world has the income that more affluent Americans have today. Imagine that everyone wants as many useless medical treatments as insured Americans receive today, everyone wants to spend as much on schooling as the most affluent American suburbs do today, everyone wants to drive to the mall and shop till they drop, everyone wants an oversized house in a sprawl suburb and at least two family cars. People are not satisfied until there are more motor vehicles than registered drivers in the world, as there already are in the United States.

To reach this standard of living, growth would level off when the per capita Gross World Product is roughly twice as much as America's per capita Gross Domestic Product today.

Even in this scenario, America would immediately take the first step toward a no-growth economy. We would have to offer choice of work hours, so Americans who are already prosperous suburbanites could cut back on their hours rather than earning more. Most Americans would want to increase their earnings, but growth would continue to slow in future decades, as more people reached this income level.

To let everyone live in this consumerist style would require a Gross World Product of just over \$600 trillion in 2000 dollars, making the per capita GWP about double the current American per capita GDP. At the historic growth rate of per capita GWP, the world will reach this level toward the end of the twenty-first century. If economic

growth slows as the developed nations stop growing, the world might actually reach this income level some time in the twenty-second century and then move to a no-growth economy.

The world would be less livable in this scenario than in the last one. For example, about 4.5 billion acres of land would have to be suburbanized for people to live in sprawl suburbs, compared with about 900 million acres for people to live in streetcar suburbs.⁶⁷ Low-density suburbia would eat up virtually all the open space in densely populated countries. Because of limited space to build roads, most people in the world would be faced with constant traffic congestion. The open space preserved as parkland would be filled with jet skiers, snowmobilers, and off-road vehicles. There would not be many quiet places left in the world.

In this scenario, the world economy would move well beyond the point of counterproductivity. Though this would be a less pleasant world to live in than the first scenario, it could be sustainable ecologically if we increased resource efficiency about fifteen-fold. Technologies are not yet available to do this, and the most ambitious goal that has been suggested is a ten-fold increase in resource efficiency.⁶⁸ If we invested very heavily in research and development of more resource-efficient technologies, in recycling, and in renewable energy, it might be possible to produce a Gross World Product of \$600 trillion per year permanently, without resource depletion or disastrous global warming, but it is more likely that ecological problems would cause the world economy to decline while poverty was still widespread.

“As a third scenario, imagine that we continue to believe the economists who tell us we need growth to avoid unemployment.”

Scenario 3: Growth Does Not End

Finally, as a third scenario, imagine that we do not do not allow choice of work hours. Instead, we continue to believe the economists who tell us we need growth to avoid unemployment, so the entire world decides it must stimulate demand and promote growth endlessly to create more jobs, as America did after World War II.

There would have to be heroic efforts to promote more consumption. Today, people who earn millions of dollars a year save much of it, but if everyone earned millions, people could not be allowed to save much. The population as a whole has to spend almost all of its income on current consumption, in order to avoid recession and unemployment.

To absorb extra purchasing power after everyone has cars, governments world-wide might promote helicopter use. At first, helicopters would be a luxury: people who owned them could live out in the country and could vacation in the unspoiled wilderness. Once they become more common, helicopters would become a necessity. Factories and offices would locate in the Nevada desert, knowing they could hire employees from California who commute by helicopter. Married couples would take jobs hundreds of miles apart, so they could not live together without commuting by helicopter. New housing would be built where residents could not go shopping or get to work without a helicopter. The wildernesses would fill up with campers in their recreational helicopters. To avoid accidents, the helicopters would have to be guided by centralized computer systems, so all those long helicopter rides would be very boring—but that would provide another marketing opportunity: virtual-reality video games for helicopters, which people could play to pass the time.

But even with the most expensive virtual reality systems, helicopters would only absorb excess purchasing power for a few decades. Once everyone had them, we would have to invent some new expensive habit so growth could continue, even after per capita GWP reached \$4 million per year or \$11 million per year (third row of Figure 18).

	1950	2000	2050	2100	2150	2200	2250	2300	2350
Comfort	2,582	7,392	16,420	16,420	16,420	16,420	16,420	16,420	16,420
Consumerism	2,582	7,392	21,162	60,586	73,766	73,766	73,766	73,766	73,766
Growth	2,582	7,392	21,162	60,586	173,451	496,574	1,421,643	4,070,017	11,652,041

“Growth must continue, even after per capita GWP is \$4 million or \$11 million per year.”

Figure 18: Per Capita GWP in the Three Scenarios (2000 dollars)

Continued growth means that the Gross World Product keeps doubling. From 1950 to 2000, per capita GWP grew at a rate that gave it a doubling time of about 33 years, which means about an eight-fold increase every century. It is not plausible that this growth rate could continue indefinitely.

It does not make sense in human terms to consume so much. Even there were some new product (such as high-tech recreational helicopters) that everyone in the world wanted to consume, and even if it cost as much as the entire Gross World Product to provide this product to everyone, this product would only sustain growth for one doubling time. After thirty-three years, the world would have to find another even-more-expensive product for everyone to consume.

It is not ecologically sustainable to consume so much. There would be a constant race against the problems caused by growth—endless crash programs to develop technologies that could provide more raw materials, provide more energy, manage ecological breakdown, and manage social breakdown. The faster the growth rate, the more likely that we would lose this race and that there would be economic collapse and die-back—like the collapse and die-back that happened after Easter Island was deforested, but on a world-wide scale.

To Live Wisely and Agreeably and Well

What will the future be like if we avoid the third scenario and end growth at a reasonable level?

After growth ended, the economy would not be stagnant: there would still be technological change, and existing products and methods would continually be replaced by new ones. But we would adopt new technologies only if they were useful. We will not stimulate demand for more gadgets—whether or not they are useful—just to create more jobs: instead, people would work shorter hours.

There is probably a limit to how much work hours can decline, because there seems to be a limit to how far productivity in services can increase. As the economist William Baumol pointed out in the 1960s, the quality of cars does not depend on how many workers produce them, but the quality of education does depend on the student-teacher ratio. Some services are now increasing productivity because of computerization, but some services will obviously never be fully automated: we will always want people (not robots with artificial intelligence) teaching our children, producing our art and literature, and making our laws.

“If demand stopped growing, the economy would not be stagnant: there would still be technological change.”

From Necessity to Freedom

Yet work hours would decline substantially, raising the question of what people would do with their free time.

To begin with, people could use their free time do the things that improve their own well being. Instead of spending more money on medical care, people would spend more time exercising to improve their own health. Instead of spending more money on education, people would spend more time raising their own children. Instead of spending more money on suburban housing and transportation, people would spend more time working in community groups to improve their own neighborhoods.

In addition, people could use their free time to do the work they love, even if it pays little or nothing. Some would have small businesses after hours: they could earn their living by working in the mainstream economy part-time, and they could spend most of their time on handicrafts, computer art, or some other work that they do because they enjoy it, even though it earns them only a few cents an hour. Others would spend most of their time on unpaid work: for example, on study and writing, on local politics, on art, on sports, or on music. Even people whose jobs are satisfying could benefit from more free time: most college professors would be glad to have lighter class loads and more time for research, study, and writing; and lawyers, doctors, engineers, and other professionals could use their free time in similar ways.

People could do work they loved without quitting their day jobs, because their day jobs would not take much time. This sort of voluntary work can provide the feelings of accomplishment and the social contacts that most people get from their jobs today. Yet this is work that people do freely, because they feel it is interesting and important, rather than work that they just do because they need the paycheck, like most jobs today.

As Aristotle said, activities that we do freely are more satisfying than paid work, because they are done as ends in themselves, not as means to an end.

Western civilization emphasized the value of leisure from Aristotle's time until the eighteenth century, and this was still a central value at the time of the American revolution. The aristocratic Jefferson is known for his classical attitude toward leisure, devoting his free time to philosophy and architecture. The middle-class Franklin, though he is known for working and saving, actually used his savings to retire when he was in his forties, so he would have the free time to devote himself fully to politics and science.

It was only during the nineteenth and twentieth century that we came to consider the production and accumulation of wealth to be ends in themselves, rather than means to the end of living a good life. This attitude may have been useful during the age of economic growth, but when growth ends, we will be able to see that Aristotle was right to say that we work in order to have leisure, that the purpose of work is to support activities that are ends in themselves.

From classical times through the eighteenth century, the west believed in the value of leisure, but it always seemed that only a small number of aristocrats would have the free time needed to live a fully human life, and that most people would always have to toil for long hours just to produce necessities. Now, there is a possibility that most people can move from the realm of necessity to the realm of freedom, spending some of their time on necessary work but having enough free time to develop their talents fully and to live fully human lives.

“People could do work they loved without quitting their day jobs, because their day jobs would not take much time.”

How Much is Enough?

For the first time, the world economy has reached the point where we have to decide how much is enough. Throughout history, most people lived at a subsistence level: economic growth was obviously a good thing when most people needed more food, housing, basic education, and basic medical care. When we move to an affluent economy, though, we can decide what standard of living we want.

If growth continues, it will eventually reach the point where people have enough. Even Herman Kahn, who was known for defending economic growth against environmentalists, predicted that growth would end because needs were satisfied when the world's per capita GWP was about two and a half times as great as America's per capita GDP in 1975, when he wrote. It is fascinating that, if we project per capita GDP into the future, we find that in only about 10 years, America will reach the income level where the anti-environmentalist Herman Kahn said growth would end because needs were satisfied.⁶⁹

Kahn never said a word about why the world should aim for two-and-a-half times America's 1975 income level. He did endless technical studies to try prove that there would be enough energy and resources to support this per capita GWP, but he never did any studies about whether people are better off if they consume so much.

Once we begin to study this question, it becomes clear that, in the United States, we already reached a point where much of what we consume is useless. We have seen that the United States has reached the point where growth does not bring real benefits but does cause real problems. In recent decades:

“In the United States, we already have more than enough. Growth does not bring real benefits but does cause real problems.”

- Spending on health care has soared without increasing life expectancy; and our worst health problems are caused by mass-produced food that is high in fat and sugar, by smoking, and by lack of exercise.
- Spending on schooling has soared while student achievement has declined; and our worst educational problems are caused by too much entertainment and by parents who work so much that they have no time for their children.
- The amount of land we consume and the distance we drive have soared, but our cities have become less livable; and our worst urban problems are caused by excessive automobile use and by low-density suburban housing.

In each case, growth no longer brings significant benefits, but it does cause significant problems. In each case, historical and international comparisons show that at least half of what we consume is useless.

If we had strict limits on environmentally destructive forms of consumption, growth would still increase our well being as we moved beyond the levels of scenario 1, where people have half of American's current income: we could stop spending money on freeways, jet skis, sports utility vehicles, unnecessary medical treatments, and unnecessary schooling for our children, and instead spend some of this money on adult education and travel. But endless growth clearly does not make sense in human terms, any more than it makes sense in ecological terms.

In a scarcity economy, it was so important to produce more output that the GDP could be used as a rough measure of economic well being. But it no longer makes sense to use the GDP—or to use a corrected index based on the GDP⁷⁰—to measure economic well being, now that we have reached the point where we can spend more on health care without increasing average life expectancy, spend more on education without children learning more, and spend more on housing and transportation without making our cities more livable. The GDP measures total economic output, but more output no longer means more well being, so we should measure economic well being by using figures on life expectancy, infant mortality, educational achievement, hourly earnings, and the like, rather than figures based on total economic output.

Because progress is no longer improving our lives, some radical environmentalists reject modernization completely and look to primitive or preindustrial societies as models. This sort of thinking obviously is not a basis for practical economic policy, and it is certainly not convincing to people in the developing countries, where growth still is needed. Environmentalists should see that the end of growth is actually a natural result of modernization: growth should end when it reaches the point where economic needs are satisfied.

Possibilities for Our Grandchildren

In his 1930 essay “Economic Possibilities for our Grandchildren,” the great economist John Maynard Keynes had two contradictory attitudes toward free time.

Looking at how technology would affect his grandchildren, one hundred years in the future, Keynes foresaw a society where more leisure would give humanity more freedom.

All through recorded history, Keynes said, there had not been any great economic improvement. There were ups and downs, but there was not any general trend toward improved production and greater prosperity. “From the earliest times of which we have record—back, say, to two thousand years before Christ—down to the beginning of the eighteenth century, there was no very great change in the standard of life of the average man living in the civilized centers of the earth.”

But there has been continuing economic progress during recent centuries, because new technologies have made production more efficient, and because capital accumulating at compound interest has been available to invest in those technologies.

So, Keynes said, “mankind is solving its economic problem.” In the past, “the economic problem, the struggle for subsistence, always has been ... the primary, most pressing problem of the human race—not only of the human race but of the whole biological kingdom from the beginnings of life.” But in the future, “a point may soon be reached, much sooner perhaps than we are all aware of, when these needs are satisfied in the sense that we prefer to devote our further energies to non-economic purposes.”

When that time comes, “man will be faced with his real, his permanent problem—how to use his freedom from pressing economic cares, how to occupy the leisure which science and compound interest will have won for him, to live wisely and agreeably and well.”

But, in Keynes’ mind, this future was so remote that it did not influence current economic policies. Looking at the same increase of leisure as a current issue, Keynes has a very different attitude toward it: he calls it “technological unemployment ... unemployment due to our discovery of means of economising the use of labour outrunning the pace at which we can find new uses for labour.”⁷¹

In this view, more efficient production does not give us leisure and freedom. It gives us the problem of unemployment, which we must solve by finding new uses for labor.

Yet we obviously will never have more leisure as long as we believe that, to fight technological unemployment, we must find new uses for labor just as quickly as we economize the use of labor.

After World War II, this attitude toward unemployment became the conventional wisdom. All the developed nations used the methods that Keynes had recommended to “find new uses for labor.” Governments built more roads, built more suburban housing, and used deficit spending to stimulate the economy, just as Keynes had said

“We will be faced with our real, our permanent problem - how to use our freedom from pressing economic cares to live wisely and agreeably and well.”

they should to avoid unemployment. They were so successful at “finding new uses for labor” that the work week stopped getting shorter after World War II.

Today, the grandchildren of Keynes’ generation have entered the workforce. In a couple of decades, the hundred years that Keynes said we would have to wait for a future of leisure will have passed. Yet Americans have less leisure today than they did in Keynes’ time.

If we are ever going to have more free time, we need current economic policies that offer us a choice of work hours. We cannot keep following Keynes’ idea that leisure and freedom are economic possibilities for our grandchildren’s generation, but that current policies must create jobs quickly enough that there is not more leisure for our generation.

Keynes’s approach is reminiscent of the school in *Alice in Wonderland* where the policy was always to give the students jam tomorrow but never to give them jam today. No matter how much time passes, it always remains today, and we never get the leisure and freedom promised in the future.

In retrospect, we obviously would have been better off if we had given Americans a choice of work hours in the 1930s, instead of “finding new uses for labor” in order to fight technological unemployment. We could have continued to reduce work hours gradually during the post-war decades, taking some of the benefits of post-war prosperity in the form of higher earnings and some in the form of more free time, instead of promoting consumerism and suburban sprawl to maintain the 40 hour work week of the 1930s.

“What Gross World Product should we aim at, because it is best in human terms? The debate on global development policy has ignored this key question.”

Population, Technology, Consumption

Ecological sustainability depends on population, on the environmental impact of consumption (which is largely a factor of the technology used), and on the amount that each person consumes.

We can analyze the total environmental impact of the global economy using the classic equation:

$$\text{Total impact} = \text{population} \times \text{impact per unit of consumption} \times \text{units of consumption per person}^{72}$$

To move toward sustainability, we must deal with all three of these factors.

Population growth has already been the focus of national and international efforts, and fertility rates have declined dramatically during the last few decades. We should continue to work on limiting population, but this is an issue that people already understand and governments are already willing to act on.

Technology that reduces the impact per unit of consumption, has been the focus of plenty of talk but relatively little action. There are obvious things we can do. We should price energy to reflect its environmental costs as well as cost of production, causing a massive shift to solar energy and other sustainable forms of energy. We should also require products to be designed so they are more durable and easily recycled, move away from chemical farming, invest in greater energy efficiency, and

so on. These are familiar ideas, and this is an issue that people understand but that most governments are not yet willing to act on.

But consumption, the third key factor in sustainability, has been the focus of relatively little talk and of no government action. Ordinary people are thinking about this issues: there has been a voluntary simplicity movement in America for decades, and the best selling book *Your Money or Your Life*⁷³ gives people practical advice about to how live simply and save enough to stop working. But these issues have not even been introduced into the debate on economic policy.

Economists are not doing studies to find what standard of living is optimum and when economic growth should end because needs are satiated. Politicians are not advocating choice of work hours as a way of slowing and then ending economic growth.

There could be a sustainable world economy with enough for everyone if the developed nations chose a less consumerist future. The more we do to limit wasteful consumption among the affluent, the better chance we have of creating a future where growth ends because everyone has enough—not because of ecological crisis. Yet the debate on global development policy has ignored the key question: what per capita income should we aim at, because it is best in human terms?

The three scenarios that we looked at are not predictions of the future: they are projections of what would happen if growth continued—and they make it clear that growth cannot continue indefinitely. The most likely prediction for the future is that rising resource prices, global warming, and other ecological problems will prevent most of the world from emerging from poverty: there will be pockets of shaky affluence in the United States, Europe, and parts of Asia, and there will be a long series of crash programs to deal with ecological degradation and to get the world economy back on track.

If we had begun a transition to sustainable production and simpler living in the 1970s, when ecological limits to growth were first widely recognized, we could have moved to a sustainable no-growth economy without doing damage to the global environment. This smooth a transition is no longer possible: global warming has already begun and cannot be stopped, though it can be slowed.

This looming ecological crisis is all the more reason to begin the transition now.

“Consumption, the third key factor in sustainability, has been the focus of relatively little talk and of no government action.”

Appendix: Optimum Output

This appendix is an economic analysis of counterproductivity that shows graphically what the optimum level of output is. We have seen that economic growth leads to counterproductivity because the things we produce become less useful while environmental and social costs remain roughly constant. To analyze it more precisely, we will use two basic economic principles: “the law of diminishing marginal utility” and the idea of “external costs” or “externalities.”

Diminishing Marginal Utility

The law of diminishing marginal utility says that, as consumers buy more of any product, they get less satisfaction from each *additional* unit of the product that they buy. Economists use the word “marginal” to mean additional.

Imagine that people have a mental checklist of all their possible uses of a product, arranged in order of importance. As they get more of that product, they move down the list to less important uses. For example, if you can only afford a small amount of coffee, you might just drink a cup at breakfast, when you need it most. If you have more coffee, you might drink a cup in the afternoon as well—not as important but still very satisfying. If you have even more coffee, you can drink it any time, even when you do not want it much. If you keep getting more coffee, you might finally start using bags of coffee beans as paperweights and door stops. At this point, the coffee you drink at breakfast is still very satisfying, but you would not want any more coffee: coffee has a marginal utility of zero.

The law of diminishing marginal utility is essential to modern economic theory,⁷⁴ but most economists apply it only to individual products, not to products in general.

The checklist analogy clearly does apply to products in general: as people become wealthier, they buy products they need less urgently. The poorest people can afford bread or rice to eat and a crude one-room shelter to live in, things that are necessary to survive. When people become a bit more prosperous, they can afford more nourishing food, sturdier homes, basic education—very important but not as urgent as survival. When they become even more prosperous, they can buy bicycles, radios, and so on—useful but not necessities. Finally, when they become prosperous enough to buy sports-utility vehicles rather than ordinary cars and fly to Hawaii for their vacations rather than going to the local beaches, the products that they buy with the last addition to their income have relatively little utility.

Yet most economists have always said that the marginal utility of products in general would never reach zero, as the marginal utility of an individual product does. They say that consumers have unlimited appetites and will continue to demand more products indefinitely to satisfy their “psychological needs,” even after all of their physical needs have been satisfied. Economists have always emphasized the unlimited

psychological need for status, and today's consumers also seem to have an unlimited appetite for high-tech amusements.

But even if demand is insatiable, as most economists claim, products in general still have diminishing marginal utility. The psychological need for status or for high-tech amusement is not as urgent as the need for food and shelter. The products you buy as status symbols or amusements have diminishing marginal utility themselves: the first diamond ring that you buy as a status symbol gives you more satisfaction than one you buy after you already own a hundred diamonds, and the first off-road vehicle you buy gives you more of a thrill than you get from buying a snowmobile after you already own jet skis, a powerboat, an off-road motorcycle, and a private plane.

Counterproductivity still occurs, even if consumers have insatiable "psychological needs." Consumers may want to drive Hummers as status symbols, and if Hummers became common, they might want even bigger cars as status symbols, but displaying their status by driving a bigger car than everyone else gives them relatively minor psychological satisfaction that is obviously outweighed by the tangible problems of global warming and resource depletion.

Undiminished Externalities

Economists use the terms "externalized diseconomies" or "externalities" to describe any harmful by-products of economic activity. Externalities are costs borne by third-parties, who are not part of the market exchange between businesses that make a product and the consumers who buy it. The market mechanism does not take these costs into account.

For example, a factory can make products more cheaply if it dumps wastes in the river rather than treating them. Consumers will buy these cheap products rather than more expensive ones made by a factory that handles its wastes safely. Dumping wastes in the river may create medical costs that are much greater than cost of disposing of the wastes safely, but these medical costs are ignored by the factory's owners and the consumers of its products. They are "external" to their transaction, borne by third-parties who live downstream.

In a pure market economy, any manufacturer who pays to treat his wastes safely will be undersold and driven out of business by competitors who dump their wastes unsafely. A totally unregulated market economy will poison everyone's water in order to lower the cost of factory products by a few percent. Everyone suffers because a pure market economy does not weigh *all* the costs of a product against its benefits.

Environmental problems, such as water pollution, are the most familiar examples of externalities, but this term lets us think more generally about the costs of growth. For example, the effects of consumerism on education, discussed earlier, are not what we would usually consider an environmental issue, but they are an external cost of the consumer economy.

Optimum Output: A Graphic Analysis

Using these concepts, we can analyze counterproductivity graphically.

In Figure 19, the UU curve represents the total utility of an economy's output as per capita consumption increases. Because of the law of diminishing marginal utility, consumers get less additional satisfaction from each addition to production, so this curve climbs less steeply as output increases. If we accept the idea that consumers' appetites are insatiable, then marginal utility will never reach zero, but it will approach zero, as consumption increases indefinitely. As marginal utility approaches zero, this total utility curve approaches some upper limit.

“Economic growth makes us produce things that are less useful, but the environmental and social costs of what we produce remain roughly constant.”

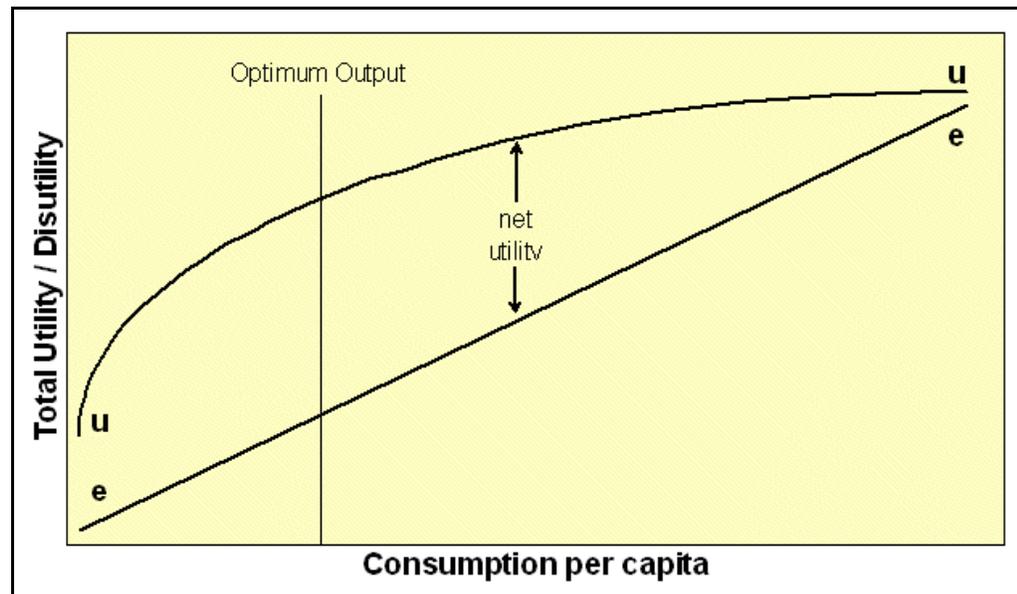


Figure 19: Total Utility and Total Externalities as Consumption Increases

The EE curve in this figure represents the total external costs of an economy's output as consumption increases. It is a straight line because the graph assumes that each unit of output creates similar external costs at any level of total output.

The EE curve is a simplification. External costs actually go up and down, depending on what products people consume and what technologies they use. This curve would jog upward as consumption increased if we needed to use less benign technologies to meet demand—for example, if we used more coal because we did not have enough natural gas to meet demand. It would jog either up or down as consumption increased, depending on what people wanted to buy with their extra income: they might want more personal services, which create low external costs, or they might want to buy more recreational vehicles, which create high external costs. (We will look at the effect of technological change in a moment.)

The vertical distance of the UU curve above the EE curve represents the net utility that the economy provides. Increasing consumption continues to make people better off as long as this distance is expanding. Counterproductivity sets in at the point where the slope of the UU curve is equal to the slope of the EE curve, the Optimum

Output line on the graph. To the left of this line, increased output widens the distance between the two curves, but to its right, the UU curve climbs less quickly than the EE curve, and increased output narrows the distance between the two. To its left, increased output brings increased well being, but to its right, increased output brings more problems than benefits and decreases people's total well being.

Further to the right, it seems the EE curve, which extends upward indefinitely, will ultimately cross the UU curve, which approaches some upper limit: this represents a point where the total external costs of the economy are greater than the total benefits of the economy, the point where there is ecological collapse and mass die-back.

The Effect of Technological Change

The graph makes it seem that counterproductivity *must* occur if growth continues: it seems that the distance between the UU curve and the EE curve must ultimately decrease, because total utility approaches some upper limit while total externalities continue to increase indefinitely.

Yet this graph leaves out technological change. It assumes that the consumers always have the same products to choose from: as their incomes increase, they just move down the "checklist" and buy less useful products.

In reality, technological innovation can have two different effects on the products people buy, which would shift the utility curve up or down. Some new technologies cheapen existing products—transistor radios are cheaper than old tube radios, for example, and we can download music over the Internet for less than it costs to buy the music at a store. On the other hand, some new technologies introduce new products that consumers want, such as polio vaccinations and camcorders.

Innovations that cheapen existing products, would shift the entire UU curve downward, since consumers with any given income could get further down the "checklist" to more useless products. Innovation that introduce useful new products would shift the entire UU curve upward, since consumers with any income would not get as far down in the "checklist."

In the long run, these two types of innovation might balance each other, as they have in the computer industry. Today, we have more powerful software, and our computers have one hundred to one thousand times as much RAM and disk space as computers did decades ago. But the cost of RAM and disk space have gone down so much that computers are no more expensive now than they were decades ago. Innovation lets us buy better products without spending more.

Technological changes can also affect the EE curve by shifting it upward or downward. For example, the change from the nineteenth century coal-based economy to our petroleum-based economy meant less pollution per unit of output, but a change from petroleum to synthetic fuels extracted from coal would mean more pollution per unit of output. It is possible to adopt policies that push the economy to develop technologies with external costs—for example, by subsidizing solar energy—and this would shift the EE curve downward.

The Effect of Environmental Policy

To avoid counterproductivity, we need to limit forms of consumption that bring a net social loss because they cause more costs than benefits, such as urban sprawl and off-road vehicles. We also need to tax goods and services to reflect their environmental and social costs, to direct consumption into more benign channels.

Environmentalists back these policies because they would shift the EE curve downward, but it is important to notice that they would also shift the UU curve downward. At any level of income, people would have fewer products to choose among, so they would have to move further down the utility checklist to spend their entire income.

As the externalities curve shifted downward, Optimum Output would increase. As the utility curve shifted downward, Optimum Output would decrease. Because these two effects conflict, we cannot predict whether these policies would increase or decrease the Optimum Output.

Some environmentalists seem to believe that taxes and other limits on pollution could allow growth to continue indefinitely without ecological damage, but this is not necessarily true. These policies would promote more benign forms of consumption, as they say, but these policies would also reduce the range of products available to consumers.

Conceivably, growth might never end. People could endlessly keep consuming more and more environmentally harmless status symbols and amusements. Even after their homes were full of them, people could keep buying more artificial jewelry, Rolex watches, and electronic entertainment, all made using environmentally harmless processes. This is not an inspiring future, but it is possible that most economists are right when they say that people are endlessly acquisitive. However, it seems more likely that once everyone has a few rooms full of jewelry and consumer electronics, people would decide that there is not much point to accumulating more, that there are more interesting ways to use their time.

We can be sure that, to optimize output, we need:

- **Political limits on destructive forms of consumption:** The most destructive forms of consumption, such as gas-guzzling SUVs, should be banned completely. Others should be taxed to internalize their social and environmental costs. If we allow these forms of consumption without any limitation, people will choose to consume things that bring them small benefits and create greater social costs, pushing output above the optimum.
- **Individual choice of work hours:** In addition, we should let workers choose their own hours, so they can decide for themselves whether they want to acquire environmentally benign products endlessly or whether they want more free time to live more fully human lives. If we require people to work a fixed number of hours, then as productivity increases, they will consume products with less and less utility even if they would prefer to have more free time, pushing output above the optimum.

We can also be sure that it is foolish to stimulate demand to promote growth and provide jobs, as Americans have done for the past sixty years, because this policy has convinced people to buy products with very little utility and has, in fact, pushed output above the optimum.

Where We Stand

In America today, we seem to be moving beyond the range where net utility stops growing and into the range where net utility begins decreasing significantly.

Through the 1950s or 1960s, Americans generally felt that economic growth was bringing everyone a better life—better housing, better education, better health care.

Since the 1970s, our per capita consumption spending has doubled, and there has not been a general feeling that life has gotten much better or much worse. Americans have been running as fast as they can just to stay in the same place.

Now, life is beginning to become noticeably worse. Obesity is making American children noticeably less healthy. Average commute time is increasing, and more extreme commuters are spending over three hours a day on the road. Most climatologists believe that global warming contributed to the severity of Hurricane Katrina, which devastated a major American city. High world demand for energy is driving up gasoline prices. Americans are still running as fast as they can, and we are falling behind.

We are at a point where we would be better off if we consumed less.

Notes

- ¹ U.S. Bureau of the Census, *Statistical Abstract of the United States: 2006* (Washington, DC, 2006) p. 448.
- ² John Kenneth Galbraith, *The Affluent Society* (New York, Houghton Mifflin, 1958). Vance Packard, *The Waste Makers* (New York, David McKay, 1960). David Riesman, *Abundance for What? and Other Essays* (New York, Doubleday, 1964).
- ³ Herman E. Daly and John B. Cobb, Jr., *For the Common Good: Redirecting the Economy Toward Community, the Environment, and a Sustainable Future* (Boston, Beacon Press, 1989) pp. 401-455. Because it is an older study, this index is based on the GNP rather than the GDP. This index was developed by John Cobb's son, Clifford Cobb. It was refined in a later book, Clifford W. Cobb and John B. Cobb Jr., *The Green National Product: A Proposed Index of Sustainable Economic Welfare* (Lanham, MD, Human Economy Center: University Press of America, 1994). Clifford Cobb then worked with Redefining Progress to help develop the Genuine Progress Index.
- ⁴ Clifford Cobb, Ted Halstead, and Jonathan Rowe, *The Genuine Progress Index* (San Francisco, Redefining Progress, 1995). For a summary, see Clifford Cobb, Ted Halstead, and Jonathan Rowe, "If the GDP is Up, Why is America Down?" *Atlantic Monthly*, October, 1995. For the latest update, see www.redefiningprogress.org.
- ⁵ Ivan Illich, *Tools for Conviviality* (New York, Harper & Row: Perennial Library, 1973) pp. 1-10. However, Illich's analysis of counterproductivity is different from the analysis in this study. He says that counterproductivity "is distinct from the declining utility obtained for a unit of currency and from all forms of external disservice." *Medical Nemesis* (New York, Pantheon Books, 1976) p. 213. Instead, he says counterproductivity is caused by the decline in competence that occurs when the technological system takes all the functions of individuals and small groups. This socio-psychological point is true, but counterproductivity can also be analyzed in economic terms, as it is in this study.
- ⁶ Robert Pear, "Health Costs Will Keep Rising, U.S. Says, Along With Government Share of Paying Them," *New York Times*, February 24, 2005, p. A21.
- ⁷ See Marsden Wagner, *Pursuing The Birth Machine: The Search For Appropriate Birth Technology* (Camperdown, NSW, Australia, Associates in Childbirth Education, 1994).
- ⁸ Ivan Illich, *Medical Nemesis* (New York, Pantheon, 1976) p. 72.
- ⁹ Victoria Colliver, "More Care Not Always Better, Study Says," *San Francisco Chronicle*, November 16, 2005, p. C1 and C8.
- ¹⁰ Elliot S. Fisher, "More Medicine Is Not Better Medicine," *New York Times*, December 1, 2003, p. A25.
- ¹¹ Source: World Health Organization, *World Health Report 2006: Working Together for Health* (Geneva, World Health Organization, 2006). Life expectancy at birth for both sexes in 2004 from Annex Table 1: Basic Indicators, pp. 168-177. Per capita expenditures for 2003 in US dollars at average exchange rate from Annex Table 3: Per Capita Expenditures on Health, 1999-2003, pp. 186-189. I have compared the United States with the average of Canada, France, Germany, Japan, and the United Kingdom for consistency with the comparison of spending per pupil and educational achievement in Figure 7.
- ¹² Source: *ibid.*
- ¹³ Sources: Life expectancy 1940-1990: Susan B. Carter et al., editors, *Historical Statistics of the United States: Earliest Times to the Present* (New York, Cambridge University Press, 2006) p. 1-440; 2000: *Statistical Abstract 2006*, p. 76; Per capita health spending 1940-1990: *Historical Statistics*, 2-511 to 2-512; 2000: *Statistical Abstract 2006*, p.98. Spending is converted to 1996 dollars using the GDP deflator from *Historical Statistics*, pp. 3-23 to 3-26.
- ¹⁴ Sources: life expectancy, World Health Organization (WHO), *World Health Report 2006* (New York, United Nations Statistics Division, 2006) Annex Table 1. Per capita GDP in 2003 US Dollars.
- ¹⁵ *San Francisco Chronicle*, July 30, 1979, p. 18.
- ¹⁶ "U.S. Child Obesity Dragging Down Overall Gains," Reuters, March 30, 2005, citing the annual report on U.S. child welfare from Duke University and the Foundation for Child Development.

- ¹⁷ Center for Disease Control, National Center for Health Statistics, *Prevalence of Obesity and Overweight Among Adults: United States 1999-2000*. Available at www.cdc.gov/nchs/products/pubs/pubd/hestats/obese/obse99.htm
- ¹⁸ Lindsey Tanner, "Fast Food Nation Continues to Expand: Study Shows Fivefold Increase in Consumption Among U.S. Children Since 1970," *San Francisco Chronicle*, January 5, 2004, p. A2, citing research by Dr. David Ludwig, director of the obesity program at Children's Hospital of Boston, published in the January 2004 issue of *Pediatrics*.
- ¹⁹ Mike Stobbe, "U.S. Life Expectancy Hits All-Time High," Associated Press, December 19, 2005.
- ²⁰ Alan Cowell, "Study Says Older Americans Are Less Healthy Than British," *New York Times*, May 3, 2006, p. A10.
- ²¹ Pam Belluck, "Children's Life Expectancy Being Cut Short by Obesity," *New York Times*, March 17, 2005, p. A15.
- ²² Carrie Sturrock, "Biologist Says Expectancy May Soon Be 100," *San Francisco Chronicle*, March 6, 2006, p. A6.
- ²³ Phillip J. Longman, "The Health of Nations: Instead of Forcing Seniors into HOMs, How About Forcing Them to Exercise?" *Washington Monthly*, April, 2003. Updated with data from Figure 3.
- ²⁴ John Taylor Gatto, *The Underground History of American Education* (New York, Oxford Village Press, 2000) p. 21.
- ²⁵ U.S. Department of Education, *Digest of Education Statistics 2004* (Washington, DC, National Center for Education Statistics, 2004) Table 163. The numbers represent total expenditure per pupil in average daily attendance in 1919-1920, 1949-1950, and 2001-2002.
- ²⁶ Dianne Ravitch, "Defining Literacy Downward," *New York Times*, Aug 28, 1996.
- ²⁷ Gatto, *Underground History*, p. 55.
- ²⁸ Sources: Figures on per pupil expenditure, *Digest of Education Statistics 2004*, Table 163; SAT scores, *Digest of Education Statistics 2004*, Table 129. These figures apply to academic years: for example, the figure on the graph for 1964 actually applies to the academic year 1963-1964.
- ²⁹ The well known Coleman Report concludes that "When these [socio-economic] factors are statistically controlled, however, it appears that differences between schools account for only a small fraction of differences in pupil achievement." James Coleman et al., *Equality of Educational Opportunity* (Washington, DC, U.S. Government Printing Office, 1966) pp. 21-22. Christopher Jencks' study on inequality concludes that "qualitative differences between schools had relatively little effect on students' test scores . . . differences between schools also had relatively little effect on students' eventual educational attainment." Christopher Jencks et al, *Inequality: A Reassessment of the Effect of Family and Schooling in America* (New York and London, Basic Books, 1972) p. 39. It also concludes that "We have shown that the most important determinant of educational attainment is family background. . . . Except for family background, the most important determinant of educational attainment is probably cognitive skill. . . ." (pp. 158-159).
- ³⁰ Eric A. Hanushek, "The Impact of Differential Expenditures on School Performance" *Educational Researcher*, May 1989, p. 45-50. Hanushek concludes that "There is no strong or systematic relationship between school expenditures and student performance" (p. 47). However, Hanushek adds that studies have shown "Teachers and schools differ dramatically in their effectiveness" (p. 48). It is only the easily measurable components of school quality—such as spending per student and teacher-student ratio—that have no effect.
- ³¹ National Center for Education Statistics (U.S. Department of Education and Institute of Education Sciences) *Comparative Indicators of Education in the United States and Other G8 Countries: 2004*, expenditures for the year 2000 on p. 17 and reading scores for the year 2000 on p. 43. Spending is converted to U.S. dollars using Purchasing Power Parities (PPPs). The other industrial nations considered are Canada, France, Germany, Japan, United Kingdom.
- ³² Lawrence Steinberg, *Beyond the Classroom: Why School Reform has Failed and What Parents Need to Do* (New York, Simon & Schuster, 1996) p. 118.
- ³³ Steinberg, *Beyond the Classroom*, p. 120.
- ³⁴ Source: Achievement scores from National Center for Education Statistics (U.S. Department of Education and Institute of Education Sciences), *Highlights From the Trends in International Mathematics and Science Study (TIMSS): 2003*, published December 2004, p. 76. The values used in the graph are an average of the mathematics and science scores. Figures on spending from Unesco Institute for Statistics, *Financing Education—Investments and Returns 2002*, Table 9: Expenditure on educational institution per student (1999). The graph only includes countries that are available in both of these studies.
- ³⁵ *San Francisco Chronicle*, Letters to the Editor, May 12 and 13, 2006.

³⁶ Kenneth T. Jackson, *Crabgrass Frontier: The Suburbanization of the United States* (New York, Oxford University Press, 1985) pp. 14-20.

³⁷ See Sam B. Warner, Jr., *Streetcar Suburbs: The Process of Growth in Boston, 1870-1900* (Cambridge, Mass., Harvard University Press and the MIT Press, 1962).

³⁸ Source: Surface Transportation Policy Project, *Green Streets*, (Washington, DC, STTP, 1997) p. 7.

³⁹ Source: Vehicle miles traveled from *Historical Statistics*, p. 4-835 to 4-836 and *Statistical Abstract 2006*, p. 715. Population from *Historical Statistics*, p.1-26

⁴⁰ For an overview of this movement, see Peter Katz, *The New Urbanism*, (New York, McGraw-Hill, 1994).

⁴¹ McLynn, J.M. and Spielberg, "Procedures for demand forecasting subject to household budget constraints" in *Directions to improve travel demand forecasting: conference summary and white papers*, HHP-22 (Washington DC, Federal Highway Administration, 1978) pp. 115-197.

⁴² Ryan, J.M. and Spear, B. D., "Directions toward the better understanding of transportation and urban structure," in *ibid.*, pp. 199-247.

⁴³ UK Dept. of Transport, *Report of the Standing Committee on Trunk Road Assessment*, December 1994 and Guidance document 24 L, based on this report.

⁴⁴ Information in this paragraph from Keith Naughton, "The Long and Grinding Road: The rat race is turning into a marathon. Inside the lives of 'extreme commuters,'" *Newsweek*, April 23, 2006.

⁴⁵ Jean Gottmann, *Megalopolis: The Urbanized Northeastern Seaboard of the United States* (Cambridge, Massachusetts, MIT Press, 1961) p. 685. Gottmann says the automobile industry was the prime example of planned waste through the 1950s: "This apparent waste, closely and increasingly associated with the generalized use of the individual automobile, has not been an evil in the past. ... To supply and maintain all these enormous fleets of cars, much used, often renewed, many industries had to develop on a larger scale. We have already mentioned the variety of materials that went in greater and greater quantities into automobile manufacturing and servicing, as well as into the construction and maintenance of the roads, bridges, tunnels, garages, and other facilities these cars needed. ... If waste there was in terms of materials, this wastefulness had become for the nation as a whole a factor of wealth and prosperity." p. 682. But Gottmann worried that the post-war love affair with the automobile was cooling down by the time he wrote. People were even buying compact cars, which used less gasoline per mile, so that we might not be able to raise funds to build freeways as rapidly as we had in the past. Gottmann speculated about which transportation industries would take the place of the automobile as engines of economic growth—recreational boating, commercial aviation, helicopters—but he did not speculate about whether life would be easier with less unnecessary transportation.

⁴⁶ Gottmann, *Megalopolis*, p. 683.

⁴⁷ To be precise, productivity in 2000 was 9.79 times as great as in 1900.

⁴⁸ Source: 1900-1957: *Historical Statistics*, p. 3-463; 1958-2000: George Thomas Kurian, ed, *Datapedia of the United States: American History in Numbers*, third edition (Lanham MD, Bernan Press, 2004) p. 134.

⁴⁹ For the complete history, see Benjamin Kline Hunnicutt, *Work Without End: Abandoning Shorter Hours for the Right to Work* (Philadelphia, Temple University Press, 1988).

⁵⁰ Source: 1840-1890: *Historical Statistics*, p. 2-301; 1890-1925: *Historical Statistics*, p. 2-303; 1930-1995: *Historical Statistics*, p. 2-306 to 2-307; 2000: *Statistical Abstract 2006*, p 414.

⁵¹ Juliet B. Schor, *The Overworked American: The Unexpected Decline of Leisure* (New York, Basic Books, 1991), p. 36.

⁵² A survey commissioned by the Center for the New American Dream and conducted in August, 2003. See www.newdream.org/live/time/timepoll.php.

⁵³ As Juliet Schor has pointed out, most employers offer the same benefit package to all workers, no matter how many hours they work, and so they have an incentive to hire full-time employees and even to make employees work overtime at time-and-a-half pay, to save on benefits. To encourage employers to offer part time work, she has suggested that businesses should give employees benefits that are pro-rated on the basis of how many hours they work: part-timers could pay extra to get the full benefit package, or could take their share of the benefits in cash. Likewise, if they habitually require employees

to work overtime, employers should be required to give them extra pay equal to the savings on benefits. See Juliet B. Schor, *The Overworked American*.

⁵⁴ *New York Times*, September 1, 1997, p. B7.

⁵⁵ Anders Hayden, *Sharing the Work, Sparing the Planet*, (London, Zed Books, 2000) p. 149.

⁵⁶ Source: *Statistical Abstract: 2006*, p. 399. The chart's category "Full-time work not available" combines the *Statistical Abstract's* categories: Slack work or business conditions, Could only find part-time work, and Seasonal work. The chart omits the *Statistical Abstract's* categories: Vacation or personal day, Holiday, Weather related curtailment, and Job started during the week, since these are not actually part-time workers, though they worked less than 35 hours during the week surveyed.

⁵⁷ Rudd Lubbers, "The Dutch Way," *New Perspectives Quarterly*, Fall, 1997, p. 15.

⁵⁸ Anders Hayden, "Europe's Work-Time Alternatives" in John de Graaf, editor, *Take Back Your Time: Fighting Overwork and Time Poverty in America* (San Francisco, Berrett-Koehler, 2003) p. 206-207.

⁵⁹ Early in the century, economists analyzed decline in the work week that occurred purely in terms of the law of diminishing marginal utility. As commodities had less and less marginal utility, people would devote more and more of their wage increases to leisure. As output and wages increased, the marginal utility of commodities would ultimately become lower than the marginal utility of free time, so that people would take all of their increased wages in the form of more free time.

Later, economists realized that when wages go up, workers also sacrifice more income for each hour of leisure they take. Higher wages create two conflicting effects: (1) the income effect: as wages rise, workers feel they can afford more leisure, and (2) the substitution effect: as wages rise, workers have to sacrifice more income to gain an extra hour of leisure. Because these two effects conflict, it is impossible to predict *a priori* whether higher wages will bring more leisure. Lionel Roberts first made this point in a brief article in 1930, and it soon was generally accepted. (Lionel Roberts, "On the Elasticity of Demand for Income in Terms of Effort," *Economica: A Journal of the Social Sciences*, series 1, vol. 10, #29, June 1930, pp. 123-129.)

Economists considered this an empirical question, and most believed that the evidence showed that there is a "backward bending supply curve" for labor: that is, at low wages, workers will work longer hours as wages go up, but at higher wages, workers will work shorter hours as wages go up. Actually this decision depends on cultural factors more than on income level. When European colonialists first hired primitive peoples to work on plantations, they found that they would only work long enough to earn food and other subsistence goods; though their wages were very low, higher wages made them shorten their hours because they only wanted to earn enough to support their habitual standard of living. Likewise, American workers early in the century shortened their hours as wages went up because they did not want to go very far beyond the traditionally acceptable standard of living. After World War II, consumer culture took over, and Americans stopped shortening their hours, despite their higher wages.

Economic theory has not moved beyond this analysis of the end of growth in terms of the income effect and the substitution effect, which dates back to 1930. In this view, the end of growth depends purely on individual choices. There is no mention of externalities, though it is very clear today that externalities are much more important than they seemed to be in 1930.

⁶⁰ Juliet B. Schor, *The Overworked American*, p. 107.

⁶¹ Spending on advertising in the United States in 2004 was estimated at \$266.4 billion while spending in the entire rest of the world was estimated at \$231.9 billion, according to Robert Coen of the Universal McCann advertising agency. Stuart Ellion, "Forecasters Expect End to Ad Industry's Recession in 2004," *New York Times*, December 9, 2003, p. C1 and C6.

⁶² Source: United Nations Population Division, Department for Economic and Social Information and Policy Analysis, "World Population Growth From Year 0 To Stabilization."

⁶³ Source for Gross World Product, 1950-2000: Lester Brown et al., World Watch Institute, *Vital Signs 2002* (New York, WW Norton & Co., 2002) p. 59.

⁶⁴ "With China's breathtaking rise toward affluence, most people live longer and have fewer children, mirroring trends seen around the world. ... As workers become scarcer and more expensive in the increasingly affluent cities along China's eastern seaboard, the country will face growing economic pressures to move out of assembly work and other labor-intensive manufacturing, which will be taken up by the poorer countries of Asia and beyond." Howard W. French, "As China Ages, a Shortage of Cheap Labor Looms," *New York Times*, June 30, 2006, pp. A1 and A10.

⁶⁵ Sources: GWP before 1950 from Herman Kahn, William Brown, and Leon Martel, *The Next 200 Years: A Scenario for America and the World* (New York, William Morrow, 1976), p. 56, converted to 2000 dollars using the GDP deflator from

Historical Statistics, p. 326. GWP after 1950 calculated based on world population in Figure 15 and per capita GWP in Figure 16, assuming that growth of GWP stops when per capita GWP reaches the US level in 1965.

⁶⁶ According to Mathis Wackernagel's studies of ecological footprints, it would take about five earths to maintain the world's current population of 6 billion at the United States' current level of consumption (see www.footprintnetwork.org). That means it would take 3.75 earths to maintain the world's peak population of 9 billion at one half the United States' current level of consumption, assuming we use current technology. Weizsacker and Lovins and have argued convincingly that we can increase resource efficiency four-fold over its current level by using cutting-edge technologies that are already available. Ernst Ulrich von Weizsacker, Amory Lovins, L. Hunter Lovins, *Factor Four: Doubling Wealth, Halving Resource Use* (London, Earthscan, 1997). Thus it should be possible to maintain the world's peak population at the standard of living of the United States in 1965, if we shift to these more efficient and more sustainable technologies.

⁶⁷ Assuming 90 percent urbanization at 2 people per gross acre in suburbia and at 10 people per gross acre in streetcar suburbs.

⁶⁸ Weizsacker and Lovins describe the Factor Ten Club, a group of prominent environmentalists who want to increase resource efficiency ten fold, but they are skeptical about whether this can be done. Weizsacker and Lovins, *Factor Four*, p. 69 and 244-245. Scenario 2 would require a fifteen-fold increase in efficiency, much more than the Factor Ten Club calls for.

⁶⁹ Kahn et al., *The Next 200 Years*. Kahn attacked environmentalists by arguing that limited resources and pollution would not stop growth in the short run, but he predicted that growth would end in the long run because of "modernization, literacy, urbanization, affluence, safety, good health and birth control, and governmental and private policies reflecting changing values and priorities..." (p. 8). At this point, people would be free to devote themselves to leisure activities (p. 22-23).

Kahn predicted that growth would end when per capita GWP reached \$20,000 in 1975 dollars (p. 6), which equals \$52,880 in 2000 dollars. When he wrote, in 1975, America's per capita GDP was \$19,961(2000 dollars). In 2004, America's per capita GDP was \$36,883 (2000 dollars). If we project its growth rate of 1960-2000, we find that in 2017, America's per capita GDP will be \$52,218 (2000 dollars), about the level where Kahn said growth would end because needs were satiated.

Kahn looked gluttonous during the 1970s, but he actually looks good today, compared with the prospect of endless economic growth that everyone seems to take for granted. Environmentalists would do well to move beyond doomsday scenarios and to see that growth could end because it is successful, as Kahn said, but at a lower level than Kahn demanded.

⁷⁰ We have seen that some studies have developed indexes that correct the GDP by subtracting externalized and defensive costs. But these indexes underestimate the decline in our well being, because they do not correct for declining marginal utility. Both the Index of Sustainable Economic Welfare, and the Genuine Progress index correct for inequality, and this correction is actually based on the law of diminishing marginal utility. Greater inequality reduces total well being because gaining an extra \$1,000 helps a rich person less than losing \$1,000 hurts a poor person: the rich person spends the money on luxuries, while the poor person sacrifices necessities. But if this is true, then it is also true that the United States as a whole benefited more from economic growth in 1900, when most people were poor, than in 2000, when most people were affluent, and the study does not correct for this. The problem is that it is easy to divide the GDP by an inequality index to correct for increasing inequality, but there is no apparent way to correct the GDP to account for the diminishing marginal utility of products generally.

⁷¹ All quotations in this section are from John Maynard Keynes, "Economic Possibilities for our Grandchildren," in *Essays in Persuasion* (New York, Harcourt, Brace & Co., 1932) pp. 358-373.

⁷² This equation first appeared in John Holdren and Paul Ehrlich, "Human Population and the Global Environment," *American Scientist*, vol. 62, May/June 1974, p. 288.

⁷³ Joe Dominguez and Vicki Robin, *Your Money or Your Life: Transforming Your Relationship with Money and Achieving Financial Independence* (New York, Viking, 1992).

⁷⁴ Adam Smith had been puzzled about the fact that some things, such as water, have no exchange value even though they have great use value, are necessary to life. Marx used the same distinction between exchange value and use value to attack the market economy. But modern economists sidestep this difficulty by pointing out that market price reflects not overall utility but *marginal* utility. To sell all the output of a product, businesses must set its price low enough that people will buy the *last* unit produced. Water was so common in Adam Smith's England, for example, that there would have been no use to producing any *additional* water. So, economists argue, when the market price of a product is high, its marginal utility is high, and the market produces *more* of what people want *more* of, in this neo-classical view (which conveniently neglects issues such as the maldistribution of wealth, which makes it more profitable to produce luxuries for the rich than necessities for the poor).