

# *Choice of Technology*

From the beginning of the industrial revolution, the rule was to adopt as much new technology as possible as quickly as possible.

A few decades ago, we began to control the most deadly technologies. For example, after a killer smog caused thousands of deaths in London in 1952 and 1953, the city of London passed laws to control air pollution, and other countries eventually followed. When DDT threatened to cause extinction of eagles, peregrine falcons, cormorants, and many other species of bird, it was banned internationally.

If these limits on deadly technologies have made our lives better, then broader limits on destructive technologies should also make our lives better. We will look at four common-sense criteria for choosing technologies: utility, environment, autonomy and quality. Because we have used technology indiscriminately for so long, it will be easy to explain what these criteria mean by finding examples of technologies that violate them – technologies that are either useless or destructive.

## **Utility**

The first criterion is utility. Is the technology actually useful?

The electric can opener is a small example that clarifies what this criterion means. Unless you have arthritis or some other debilitating disease, the old-fashioned wall-mounted, hand-cranked can opener is just as easy to use as an electric can opener. In fact, the electric can opener is a nuisance because it takes up shelf space, and one manufacturer marketed a wall-mounted electric can opener which it said would free consumers from this problem – a problem they never would have had if they had stuck with their old hand-cranked can openers. Though it is more expensive and has no more utility (maybe even less utility), the electric can opener has replaced the hand-cranked can opener almost completely in American kitchens.

This is one small example of the American fascination with new consumer technology, which helps fuel our shop-till-you-drop economy by convincing people to buy new gadgets, whether or not they are – strictly speaking – useful.

Rather than giving more small examples, let's go straight to the biggest example of how we violate the criterion of utility, our overuse of the automobile and the complex of sprawl and freeways that goes with it.

Post-war American city planners designed new development around the automobile. In the post-war suburbs that sprouted around all our cities, densities were very low, so automobiles could be the sole form of transportation without causing congestion. Housing was separated from other land uses, to prevent neighborhoods from being invaded by automobiles. Shopping was surrounded by parking lots. Freeways and major streets were designed purely to maximize the flow of automobile traffic. The low densities could not support good public transportation, and the parking lots, single-use developments, and high-speed roads made walking either

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unpleasant or physically impossible. In these neighborhoods, people drive every time they leave their houses.

This auto-oriented sprawl is very expensive: Housing and transportation account for over 50% of Americans' consumption expenditures. Yet these sprawl suburbs are no more livable than the old street-car suburbs built early in the twentieth century, where people could walk to local shopping and to public transportation. In many ways, they are less livable: For example, parents have to waste time chauffeuring their children around, traffic is often nerve racking, and you live with the everyday ugliness of freeways and strip malls.

The New Urbanists have shown that neighborhoods are more livable when they are designed like the old street-car suburbs, so they can support a balanced transportation system that includes public transit and walking as well as the automobile. But, because of post-war America's fascination with technology, we built freeway-oriented sprawl for many decades, even though it has no more utility (maybe even less utility) than neighborhood design that supports the low-tech form of transportation called walking.

## Environment

The second criterion is environmental soundness, using the word environment in the broadest sense. Does the technology create costs for unwilling third parties?

A small example that clarifies what this criterion means is the remote control automobile lock that beeps the horn to reassure the user that the door is successfully locked, which has become ubiquitous. Using remote control instead of a key is a minor convenience for the consumer, and the beeping horn is a minor nuisance for everyone else. We could have the convenience without the nuisance, if cars flashed their lights to show that the door was locked instead of beeping their horns.

Currently we just think about cost and convenience to the consumer, not about the nuisance to third parties. We would all be better off if we thought about total cost, including environmental costs.

It is easy to come up with bigger examples of the same principle. Off-road vehicles, jet skis, and other "thrill craft" are usually very noisy. They are a minor form of amusement for the consumer and a significant nuisance for every one nearby – particularly for people who took a trip out of the city in to find some peace and quiet. The off road vehicles also tear up the land, and the jet skis dump oil in the water.

The biggest example of this principle is our overuse of fossil fuels, which has released so much carbon dioxide into the atmosphere that global warming will impose huge costs on future generations. Most of America's electricity is generated by burning coal, which emits twice as much carbon dioxide as natural gas. Solar electric power costs about twice as much as power generated using fossil-fuels, but it emits no carbon dioxide. If we took into account all costs, including future environmental costs, we would shift to solar power, even at its current price; after it became widespread, its price would go down.

## Autonomy

A third criterion is autonomy. Does the technology make people passive and powerless, or does it help them to do more for themselves?

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For example, television reduces autonomy by turning people into passive consumers of entertainment. Microcomputers can increase autonomy by letting people join on-line discussion groups, produce publications, record and produce music, and do other productive activities on their own.

We cannot always follow this criterion. For example, small-scale production would increase autonomy, but large-scale factory production is usually so much more efficient that it is economically necessary, even though it reduces autonomy.

Since the 1970s, the appropriate technology movement has brought the criterion of autonomy to the world's attention by developed small-scale technologies that allow independent local production. These technologies are useful in developing nations where there is little capital and very low wages, but it is not realistic to expect the developed nations to abandon mass production.

In the United States, the ideal of appropriate technology is useful as a reminder to avoid technologies that make us passive and powerless. For example, we should control our addiction to the mass media and instead start using our time more constructively. Likewise, we should stop thinking of ourselves as passive consumers of health care and instead start eating well and exercising to improve our own health.

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## Quality

The fourth criterion is difficult to name, but it might be best to call it quality. Technology lets us do things in ways that are cheaper, quicker, or easier – but that are not the real thing. Is the technology an artificial substitute that is drastically inferior to the real thing?

There are many small examples from the modern food industry.

During much of the twentieth century, the big bread manufacturers promoted white bread, because its long shelf life allows large-scale production and distribution. It has a long shelf life because it has so little nutritional value that it cannot support the growth of most microorganisms. The bread manufacturers add artificial vitamins and minerals, but these make up for only a small fraction of what they remove. For example, whole wheat bread naturally has over twenty B vitamins; white bread has a few B vitamins added, which are cheap to manufacture. Whole wheat bread is high in fiber; white bread does nothing to make up for the lost fiber. The artificial nutrients that are added are not a real substitute for the natural nutrients that are lost.

Likewise, most packaged foods include hydrogenated oils. Hydrogenation increases shelf life by making the oil less likely to become rancid, so it works well for large-scale production and distribution. But recent research has shown that these trans fats increase the threat of heart disease so dramatically that some people say they should be banned. They are not a real substitute for natural oils.

A bigger example is our use of drugs to create an artificial substitute for good health. Many Americans are overweight because of bad diet and lack of exercise, and this puts them at risk of heart disease, diabetes, and other illnesses. Our solution is to prescribe statins, which reduce the risk of heart disease; the standards keep changing so the population that doctors recommend statins to increases each year. Doctors say that we should change our lifestyle in addition to taking these drugs, but obesity rates keep going up, so it is clear that many Americans take drugs instead of changing lifestyle. Yet these drugs only deal with high cholesterol levels, and they leave us overweight, sedentary, and far from optimum health. They are not a real substitute for living healthier lives.

Even worse, we have begun to use psychiatric drugs to create an artificial imitation of happiness. Psychiatric drugs can be useful in the case of real mental illnesses, but they are grossly over-prescribed in America. The United States has 90% of the world's cases of ADHD, and it is clear that we prescribe Ritalin to many of these children to adjust them to preschools or to schools that are not suited to their temperaments. Likewise, we prescribe Prozac to adults to help them cope with overwork and stress. It is easy to take a drug that makes you feel good, but it is not a real substitute for changing your life for the better.

We cannot always follow this criterion either. For example, if we had all our clothing custom made by tailors, it would fit a bit better than our usual mass-produced clothing, but it would be much more expensive. The quality of mass-produced clothing is adequate, and it is not worth paying the extra cost for custom tailored clothing.

This criterion is most important when the high-tech product is completely ersatz and is not a substitute at all for the low-tech product that it replaces – as taking statins to lower cholesterol is not a substitute for eating well and exercising, and as taking Prozac is not a substitute for living a satisfying life.

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## **With and Without Choice**

Some choices of technology must be required by law, such as limits on off-road vehicles, and others should be voluntary, such as reduction of the time we spend watching television. Both political and personal choice of technology will come when we finally realize how destructive our failure to choose technologies has been.

Because we have failed choose technologies based on utility, we spend so much money on high-tech toys and on automobile-centered neighborhoods that we have to work long hours and do not have time for our families and our own interests. America has longer work hours than any other industrial nation, longer work hours than had three or four decades ago. We should use technologies that save labor, but avoid the technological consumerism that makes us waste our time in useless getting and spending.

Because we have failed to choose technologies based on full environmental cost, our quality of life has declined. The group Redefining Progress has compiled the Genuine Progress index, which corrects the Gross Domestic Product for environmental costs, and it has found that both the GDP and our genuine well being increased through the 1960s, but that since the 1970s, our genuine well being has declined, even though the GDP continued to grow as quickly as ever. In the coming century, global warming may cause a drastic decline in our well being.

Because we have failed to choose technologies based on autonomy and quality, we spend most of our spare time as passive consumers of entertainment, stultified by the mass media. We do not even take the initiative needed to promote our own health; instead we consume drugs.

If we began to choose technology based on these four criteria, we would consume less and have more free time for our families and our own interests. We would get rid of environmental nuisances that degrade our quality of life, and of environmental threats that endanger our future. We would have the free time and the initiative needed to promote our own health and happiness.

We have used technology indiscriminately for so long that our lives are cluttered with useless and destructive technologies. We would be much better off if we got them out of our way.