

## 8. GROWTH

Americans seem to worship growth. Every business aims above all for growth; it wants to expand, to get bigger. No one ever heard of a city or town bragging about having lost population. The news magazines worry us about any slowdown of the rate of growth of the economy. There are reasons that make some sense of this in each case. But there are also some reasons for paying more attention to the problems caused by growth and for considering how to do better without growth and its problems.

Only relatively recently have we become sufficiently aware of pollution problems. Our environment has a natural absorptive capacity, so pollution on a small scale is not a problem. It becomes a problem with growth--with growth of industry, growth of cities and of population. We are now overloading the economic system with air pollution, water pollution and land pollution, all of which are a cost, not to the polluter but to others. Indeed even our life-support system is harmed with a variety of these pollutants. Air and water pollution, and toxic wastes on land, will become increasingly serious problems unless we take more vigorous steps than we have so far to reduce pollution, and indeed to clean up some of the mess we have already made. At least we are being constantly reminded of this now by the environmentalists, so the seriousness of the problem is not because it has not been called to our attention.

One of the major sources of air pollution is the use, in ever increasing amounts, of the fossil fuels for energy-- energy to grow our food, to run our industries, to heat or cool our homes, to run our cars, to fly our planes and to keep exercising our military equipment. A few comments on this will suffice here. This has been called the petroleum age because of the extent to which oil is now being used, primarily for energy, but also for various petrochemicals. Some wag has said that we are now eating oil, meaning that our food is not produced by using horse drawn plows any more but by all sorts of gasoline driven agricultural machinery and by artificial fertilizers. Even when government does insist on Improvements in gas mileage for cars, this has in the past not even keep up with the growth in numbers of cars and increased mileage traveled by each car. And the gasoline used by a family car in a year is exceeded by that used in a couple of hours by a fighter plane or bomber, some of which are kept aloft all the time.

How long this oil age will last is questionable. We are using oil at a growing rate. Several times people have predicted that there was only about 35 years supply of oil left in the world, and since we are still told that, some people think we will always find more oil when we need it. Economists say oil prices and the prices of other forms of energy will rise if any shortage

develops, and that will make it pay to find more, so there will be no energy problem. Unfortunately, there is good evidence that the supply of oil is not practically inexhaustible. And the engineers have pointed out correctly that, as we use up the most readily available oil first, we will slowly arrive at the point where it takes more energy to obtain more oil than we can get from the oil when we use it. That will end the oil age completely. The end will not come suddenly, but it will come, and in a foreseeable future, likely within the 21st century. That of course will mean we have to devise ways of using other forms of energy for everything now using oil. That may be especially difficult for car and plane travel. Coal can substitute for oil for home heating and for some other purposes for a long time, but it costs a lot to deal with the pollution from burning coal.

Atomic energy was once thought to be the answer to all energy problems, but now we know better. No one has yet figured out any way to handle safely, let alone at reasonable cost, the problem of disposing of worn out atomic energy plants and the millions of tons of radioactive waste from these plants, waste which will still be dangerously radioactive even after 25,000 years. The plunge into atomic energy was made hastily on the basis of false government assurances that it could handle the problems and that it would even cover insurance costs on risks that private insurance refused to cover. So atomic energy became competitive because not all costs were borne by the industry, which then grew with the government subsidy.

The final answer to the energy problem has to be the extensive development of solar energy technologies. However very little research is being done as yet to find out what can be done in this regard or how. Even if the greenhouse effect is not produced by other pollutants, it may be brought about by too much growth in energy use, since all energy use contributes heat to the environment--all, that is, except getting more work out of the sunlight that now falls on the earth and is absorbed there. In order to develop new solar energy technologies, perhaps we need to have a project somewhat like the big Manhattan Project that developed the atom bomb. And we should not wait until oil supplies are nearly depleted.

Oil is not the only natural resource that is being depleted at an increasing rate because of growth of population and production. The supplies of virtually all natural resources are being depleted at increasing rates. It does not suffice to say that the earth's crust provides a virtually endless supply of natural resources. It is like saying that there is no end to the iron ore in the Mesabi Range. As the better ores were used up it was necessary to develop a technology to use Taconite, a lesser grade ore. And although it is still possible to extract iron ore in the area, the concentration of ore in the ground will get so low that it will eventually become prohibitively

costly to extract it. Depletion of the supplies of natural resources is thus a problem that cannot be dismissed by saying there is always more, just at a little more cost.

The most extreme optimists say that there is one inexhaustible resource, namely the ingenuity of the human brain, and that this can be relied upon to solve any human problem. Humans will have to grapple with the resource depletion problem one way or another. But the degree of initiative and human rationality displayed thus far in history is not enough to make one complacent about how soon or how well each human problem, including the resource & energy problem, will be handled.

Clearly one part of the necessary answer to natural resource depletion problems will involve various ways of inducing recycling. As yet we are not geared up to recycle on a very extensive scale. But we need soon to make it more profitable to recycle everything possible and conserve virgin resources for use where recycling is not feasible.

There are of course many resources that are replenishable. Although we are seriously depleting our exhaustible natural resource capital upon which our economies have long depended, what about the resources that are replenishable. Unfortunately the story is not very good there either.

What we are talking about now is part of our life-support system. It includes the soil which grows our food and fiber crops and the grasslands on which our farm animals graze, the water which provides us fish, and the forests which provide wood and indeed are important in the oxygen balance as well as flood control. The world economy is now overloading each of these resources in an increasing number of places.

We are over-foresting rather than operating forests on a sustainable yield basis. This is true in virtually all countries in the world. Forestry companies protest if what they cut is restricted, and labor complains that they lose jobs, but almost all of them will be completely out of business in the long run if they are not forced to operate on a sustainable yield basis. In the less developed countries, people now have to walk long distances to get wood which is a major fuel for them. The tropical rain forests, which are so important for the oxygen balance of the globe, are being invaded for farming, mining or grazing. This is especially tragic since the rain forest soils, seemingly so fertile, are actually very fragile and will not support such new activity very long. So before long they will have to be abandoned, and more of the rain forests will then be invaded and the process will start all over again. Once gone, the rain forests cannot be revived. Since all nations will suffer the consequences, they all need to help nations

with such forests to preserve them before it is too late to do so.

The seas we might suppose are so vast that there could be no problem of getting all the fish for food that we might want. But it is not so. We have developed such large scale efficient fishing technologies that we are currently overfishing them in an increasing number of places. If too many fish are taken, the fish population declines. The number of fishermen who can make a living by fishing is now steadily declining. Fishing is also a matter of not exceeding the sustainable yield amounts, and if we destroy some fishing areas, the sustainable yields will decline for a long time unless or until the old areas recover sufficiently to be fished again--this time on a sustainable yield basis.

Grasslands are being overgrazed by placing too many animals on the land. This is now referred to as the tragedy of the commons. It pays each farmer to put more animals on the grasslands, but when too many do so, the grasslands are destroyed, and with it the possibility of grazing the animals. The Sahel desert in Africa is one recent example of the outcome.

Last but by no means least, let us talk about over-cropping the soils of the planet. We have learned a lot over the years about how to preserve the fertility of the soil. One can hardly overemphasize the importance of preserving it. For it takes a long long time for topsoil to be made by natural forces. And there is not a large amount of unused land that could still be put into crops. Indeed urbanization and the growth of urban sprawl is reducing the amount of crop land all the time.

We have learned that soil fertility can be maintained by allowing some land to lie fallow for a time after cropping it. We have learned how a proper rotation of crops helps maintain soil fertility. We have learned ways to protect soils against wind and water erosion, erosion that can remove vast tons of rich topsoil in a short time. But for all that we have learned, farmers are often obliged by economic competition to over-crop and hence slowly deplete their soil. We have long had a federal government soil conservation service, and we know a lot about ways to help conserve the soil, but government efforts are a drop in the bucket when farmers are induced by competition to overload and deplete the soil.

It should be clear by now that all these problems of pollution, depletion, and overloading our life-support system will be made worse the bigger the population grows. And world population has been growing since world war two at historically unprecedented rates, both in percentage terms and in absolute numbers. U. S. population has more than doubled in my lifetime. And the third world, Asia, Africa and Latin America have growth rates of 2% and 3% a year. At a 2% growth rate, a population doubles in about 35 years. When a 1 billion population doubles, it adds

1 billion people to the earth. When our 6 billion population doubles, it adds 6 billion people to the earth. That is a whale of a lot more people to feed. Since world war two, the world population has gone from about 3 billion people to over 6 billion, and it is adding every year more people to an overburdened environment than were added the previous year.

The world does not even feed present populations adequately, so how will it feed and provide a decent standard of living for another 6 billion or so which will arrive in the next few decades? We cannot double the amount of good tillable farm land--the potential simply does not exist. We are not likely to be able to double the productivity of land already being overused and depleted. We cannot likely produce more "green revolutions" every generation to raise productivity as much as was done for India by the University of Minnesota's Norman Borlaug in my generation. Yet the many people already living in very serious poverty, plus those to be born into it, deserve no less than the rest of us an opportunity to have a decent life. Most of them are willing to work for it, but their circumstances may provide no such opportunity. One of the most important tasks of the 21st century will be to open up such opportunities insofar as possible.

The basic choice however will be between ever more people at a low standard of living and fewer people at more decent standards of living. Indeed we need to face squarely the fact that world population cannot continue to grow forever. The earth is finite, and space is limited even if we all had to live in skyscrapers. This is something that cannot be debated--it is a fact that a finite globe cannot support a population that grows continuously. Nor do we have such an excess of energy that we can shoot off to unknown distant planets that could support human population all the population we could not support. Our population growth must stop soon--almost certainly before it doubles more than once from 6 billion.

The first question that is fundamental is what will stop population growth. The second fundamental question is whether it will stop at a level that makes a decent living possible for everyone, or at what possible standard of living it will stop. It is no longer sensible to suppose that whatever the population growth, further technological progress can always outrun it and produce an abundance for all. It cannot outrun or overcome the finiteness of the earth.

The old Malthusian checks of war, famine and disease will stop population growth if nothing else does. It would be more sensible for people to limit their families voluntarily, or even for government policy to force limits, at levels that make possible a decent life for everyone, than for Malthusian checks to limit population at levels of utter misery for most people.

If some people limit family size and too many others do not, world population might still continue to grow rapidly. Then the only way to make a decent life possible for most people would be forcible family limitation, which is of course an outcome nobody wants. The dilemma may have to be faced in the future unless voluntary efforts make it unnecessary. No island of well-to-do people in a starving world could last, so the industrial nations cannot ignore the problem indefinitely.

Family size is partly a matter of how many children the parents want, partly a matter of family planning and access to contraceptives. An expansion of the educational activities of the UN Population Fund is very important. It is fairly clear that if the education and status of women in less developed countries is raised significantly, birth rates will decrease there. Even apart from that, it is important to raise their education and status as part of the economic development of the less developed countries. The development needs of less developed countries should proceed with full attention to its population and environmental implications.

It is very encouraging to find out in the book *NATURAL CAPITALISM* by Paul Hawken, Amory Lovins and Hunter Lovins that many businesses can, even with present technologies, make money by paying more attention to the environment, polluting less and conserving resources. More businesses worldwide need to do that. And governments need to do more than they have yet done to protect the environment and the life support system that nature provides. But with more women entering child bearing ages than ever before in human history, world population will likely grow beyond the sustainable level and need to be reduced. If people do not reduce birth rates overall, Malthusian checks will do so. The earth can only support a limited number of people at decent standards of living.

The human race can have a wonderful bright future ahead of it-- provided it gets its birth rates down enough.