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GROWTH: MEETING THE CHALLENGE

by

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The betterment of mankind has always been the highest concern of Western civilization. It is a recurring theme of our poetry and novels. It is evidenced in our art and music. It is the basis of much of our religious and philosophical thought. And, of course, it is expressed in our political and economic institutions.

It should not be surprising, then, that every age has aspired to improve man's condition. It should not be surprising, either, that in every age, no matter how great its power to advance man's welfare, there have been those who have not deemed their own era a resounding success. Since man has been recording his fate, complaints have been registered that his progress has been either too fast or too slow, his institutions too rigid or too shaky, his ideas too radical or too conservative, his future too uncertain, his past too neglected, his aspirations too great, and his performance too little.

Why should we, therefore, be surprised that in our own time, our own institutions and aims should be neither wholly accepted nor proven to be wholly workable? When has there been, ever, total devotion to and perfection in man's affairs?

Thus, in our age, the age of scientific man, we always find debate on the proper ends of mankind hinging on the uses to which science can be put; and, once science has been put to use, on whether or not the application is successful or proper. When scientific progress was sporadic and slow, our institutions had at least more time to debate and to adapt to the implications of change. But now it is common knowledge that in this and the last centuries our scientific and technical advance has proceeded so much more rapidly, and the application of knowledge has created so many more uses for and demands on our physical and spiritual resources, that questions understandably arise as to the ability of our institutions — social and economic — to encompass and control the multitudinous effects of such changes.

Our present day is but a moment in the history of man, but to us it is an *important* moment, because we now realize that our ability to do the right thing or the wrong thing is likely to have a much greater impact on future generations than in previous generations.

But perspective is needed. The cries of alarm at what we now do are, if history is any guide, exaggerated. Man has demonstrated that he will not queue up for disaster indefinitely, our instincts for self-preservation being as strong as our penchant for predicting disaster itself. Indeed, our historically demonstrated unease over the future is deep in our psyche, and stems from our instinct for self-preservation and our wonderment about the purposes of life and the meanings of death.

For our own civilization, and especially in the countries of Western Europe and America, the present age has been characterized most by a rapid and substantial improvement in the material well-being of man. This benefit has not been without its costs, both material

Note: This is an amended version of a luncheon address to the Northeast Industrial Developers Association's Annual Conference, Manchester, N. H., Oct. 3, 1972.

and otherwise. Some of these costs are measurable and have been measured. Some are measurable but have not been measured. And some are immeasurable, but are thought to have been measured.

Two major variables that affect our average well-being are population and industrial production. They have been growing at exponential rates. But our physical resources are fixed, in the sense that the world has bounds. Further, substantial elements in our present system of production appear to have side effects that are unaccounted for and are deleterious and possibly disastrous for our well-being. Put all these together and you get the proposition that at some time the *limits* to expansion will be reached; that, given exponential population growth and the great increase in output and consumption attendant to it, the system is bound to reach its limits sooner rather than later; and that the consequent disasters may be more traumatic as a result of their appearing too soon for us to adapt ourselves to them.

This argument is not new. It was given in its purest form by T. R. Malthus, the parson turned economist. Every student of elementary economics has been exposed to the proposition advanced by Malthus that the world population was going to outrun the food supply, so that starvation would ensue as the final limit to population growth. With the technological advances in agriculture, his gloomy prediction happily did not materialize. But the proposition he advanced did not die with lack of proof. It has attained new life and vigor by admitting as an exponential variable one that Malthus assumed to be a constant – technology. Technology is the means whereby we not only exploit the earth's resources but also raise consumption per head. This ever-increasing consumption on the part of an ever-increasing population, this pushing back of the law of diminishing returns—while sustaining the present—will, it is said, impoverish the future. To make matters worse, the less developed nations are cited as examples of both Malthusian versions, the new and the old, at work at the same time.

The developed nations, on the other hand, with their voracious appetites for resources, are accused of using up the world's natural wealth at a rate that will only speed up the process, to the ultimate detriment of rich nation and poor nation alike.

These are not the only effects of growth which are viewed with alarm. Our industrial technology produces a volume of effluents that pollute and sometimes even destroy our air, our rivers, lakes, and seas, and our bodily mechanisms. Indeed, a long list of bad effects of the industrial and scientific age has been drawn up, long enough for many to call for an immediate indictment of growth before the bar of history.

On the basis of this reasoning, growth is not only condemned, it is denied—denied in the sense that, while admittedly our modern age has increased its output, it has not increased its welfare. According to this line of argument, our growth is not real, or at the very least, nowhere as real as we think it is, for we have neglected to count all the costs. A growing gross national product is not the proper measure of our well-being. We need new measures of our well-being. GNP may be at the base of these measures, but much else has to be included, and many adjustments to or deductions from GNP have to be made before we are able to get a proper evaluation of reality. Our system of income and product accounts is said to be suspect, especially because it does not give a true picture of economic welfare and virtually ignores measuring social welfare.

Thus, we have been not only worshiping a false god—growth—but also measuring the effects of growth, and growth itself, incorrectly. The climate of opinion has changed dramatically. Growth is suspect.

Is it obsolete? If so, this is a sorry state of affairs. Before bitter despair sets in, perhaps we had better investigate the allegations. This the National Bureau is doing, true to its history of seeking facts and tested measures of economic performance rather than subjective

opinions. Our past research that has led to the development of and improvement in the national income and product accounts as primary measures of economic performance and the path-breaking work of Simon Kuznets on economic growth, for which he was awarded the Nobel prize in economics, are now being extended by new investigations into an expanded set of economic and social accounts. These include measures of nonmarket time use, the division of output between current and future use, and the economic and social costs associated with environmental change. In this connection, James Tobin and William Nordhaus of Yale have completed for the Bureau a very interesting and important piece of work which is a pioneering attempt to quantify some of the important differences between the concept of goods and services produced in the market and the welfare concept of goods and services available for ultimate consumption. Their study, published in one of the National Bureau's 50th Anniversary Colloquium Series, that on *Economic Growth,* is entitled "Is Growth Obsolete?"

Tobin and Nordhaus discuss the development of economic growth theory from the classical theory of the stationary state to modern neoclassical growth theory and the acceptance of the economic growth norm and its proclamation in the early 1960's as an objective of government policy: to get the economy to produce at its potential, and perhaps to raise that potential by accelerating the productivity of labor and increasing the accumulation of human and physical capital. Growth advocates have always been aware of the difficulties of increasing growth rates and of the necessity for sacrificing present consumption for the benefit of future generations. Thus, Tobin and Nordhaus note both that those who advocate growth place future above present and that, ironically, "the antigrowth men of the 1970's believe that it is *they* who represent the claims of a fragile future against a voracious present."

They direct their attention to three problems raised by those who question the desirability and possibility of future growth. First, the usefulness of output measures for evaluating the growth of economic welfare; second, the question of whether the growth process must waste our natural resources; and third, how the rate of population growth—especially zero population growth—affects economic welfare.

In meeting their first problem, Tobin and Nordhaus construct, within the existing national income and product accounts (NIPA), a new measure of economic welfare (MEW). I will not trouble you with all of the complicated adjustments and many pitfalls inherent in constructing such a measure. The authors admit their measure is "primitive and experimental"—but it *is* a *measure,* at least—and I think it a remarkable start toward the kind of work that needs to be done to guide us in the future.

Briefly, the work involved adjusting personal consumption by (1) *deducting* instrumental expenditures (i.e., intermediate rather than final goods) such as defense and sanitation expenditures, durable goods and other household investments, and an amount for "disamenities of urbanization," and by (2) *adding* the services of consumer capital, an imputation for leisure, and an imputation for nonmarket activities, along with government consumption and the services of government capital, to arrive at MEW total consumption (MEW net investment is deducted to arrive at sustainable MEW). MEW is, then, quite different from our conventional measures of output.

The authors conclude that *per capita* MEW has been growing at a 1.1 percent annual rate since 1929, while net national product, the conventional measure, has been growing at 1.7 percent annually. Thus, "the progress indicated by conventional national accounts is not just a myth that evaporates when a welfare-oriented measure is substituted." Our growth *is* real, both materially and in terms of economic welfare.

So far as natural resources go, the Tobin-Nordhaus simulations, made both over a

three-hundred-year and a fifty-year period, imply that "growth will accelerate rather than slow down even as natural resources become more scarce in the future." Their results are consistent with the fact that the substitution of capital and labor for resources is high (significantly greater than unity), or that technological change is relatively resource-saving, *or both.* Tobin and Nordhaus have *not* found evidence to support the fear that natural resources will be an increasingly severe drag on economic growth. Indeed, the opposite is true: "Growth of output per capita will accelerate ever so slightly even as stocks of natural resources decline."

We all know that population growth cannot continue forever. There is little to guide us in developing a theory of fertility to fit the observed facts, however. The National Bureau's work under the direction of Victor Fuchs and others is continuing research on fertility patterns and their economic determinants. Tobin and Nordhaus concluded that "in a ZPG equilibrium sustainable consumption per capita would be 9-10 percent higher than in a steady state of 2.1 percent growth corresponding to 1960 fertility and mortality, and somewhat more than 3 percent higher than in a steady state of 0.7 percent growth corresponding to 1967 fertility and mortality." They also found that "as between 1960 equilibrium and ZPG, the diminished drag of resource limitations is worth about one-tenth of 1 percent per annum in growth of per capita consumption."

Their conclusion:

> Although GNP and other national income aggregates are imperfect measures of welfare, the broad picture of secular progress which they convey remains after correction of their most obvious deficiencies. At present there is *no* reason *to arrest general economic growth to conserve natural resources, although there is good reason to provide proper economic incentives to conserve resources* which currently cost their users less than true social cost. Population growth cannot continue indefinitely, and evidently it is already slowing down in the United States. This slowdown will significantly increase sustainable per capita consumption. But even with ZPG there is no reason to shut off technological progress. The classical stationary state need not become our utopian norm.

I might say that, as to a choice between zero population growth or zero economic growth, the former need not result in an unacceptable state of affairs, but the latter undoubtedly will. ZPG can, under the proper conditions, raise *per capita* welfare, but zero economic growth will make it very difficult to avoid internal social and political stress.

But I wish to go beyond the conclusions reached by Tobin and Nordhaus. It is folly to ignore the political and social effects that might ensue from a blind adherence to the notion of a stationary state. While we may all agree that growth *per se* is not an end to be sought as a thing in and for itself, it would be foolish of us to attack technological change when technological change may be the only effective route to an increase in the general welfare of man, or to attack education and science because education and science can be misdirected, or to turn to antiscientific and Luddite behavior because science and machines have not brought us Heaven in our time. The fact that we do not live in paradise has long been recognized, but this does not mean that the alternative is Hell on earth. And surely a no-growth economy will create troubles. For example, will domestic tranquility increase when the poor ask the rich for a larger share of the unchanging total product (or a total product which increases only enough to keep per capita product constant)?

A no-growth economy will have to beg resources from one use to put them to work elsewhere; government revenues will not create via the fiscal dividend the wherewithal to finance new programs considered socially necessary; and the resources necessary to win the battle against pollution, poverty, and disease will be harder to come by, not easier.

The prospects, however, for a stable-state, no-growth economy coming into existence after a long history of growth which has shown the way to progressive improvement in mankind are slim. In the first place, it is politically unlikely. In addition, it is technologically unlikely. This is an important, and too often neglected, point. We must not forget that, even if we wanted to, we probably could not invent a political system and a social ethic that would contain, restrain, or prevent technological change. We would literally have to overturn Western civilization and its ethical norms. We would have to completely control science. Science has a life of its own. We cannot predict where it will go, or take us; if we knew, we would already be in possession of the secrets of the universe. Nor can we control or inhibit the minds of men. We will always tinker with our world. The problem is to put scientific method and scientific results to the proper uses of mankind. Antiscientific biases lead only toward myth and simplistic solutions, with all their ideological dangers.

Thus, my view of the no-growth economy is that, however undesirable or unnecessary it may be from an economic point of view, it is far more undesirable, indeed dangerous, from a political point of view.

So far as ZPG goes, the most recent census projections show us now to be at a reproduction rate of 2.1, or about the ZPG rate in the absence of immigration.

We have found, then, that there is substantial evidence not only from our observations of the historical development but also from the Tobin-Nordhaus work that the answer to the question "Is growth obsolete?" is *no*. And if it is no from the point of view of economic welfare, it certainly reinforces the necessity of growth from a political and social view.

The choice before us is not to slow down or to stop growth. It is to direct growth, as best we can, into useful and socially productive channels. If our population growth slows down, consumption per capita can continue to rise without serious effect on our resources. And certainly the poorer nations will demand a significant increase in *their* material well-being, even if we do not.

However optimistic we might be about events in the future, there are sure to be cries of impending doom. Nowhere is this more evident than in the recent *The Limits to Growth,* which was given the endorsement of the Club of Rome and greeted with much fanfare a short while ago. Carl Kaysen, in a perceptive and pointed review in *Foreign Affairs* entitled "The Computer That Printed Out W*O*L*F*," rightly takes issue with its major conclusions. Systems Dynamics and the invocations of the computer combined to produce a good deal of nonsense. Kaysen shows why the "authors' analyses are gravely deficient and many of their strongest and most striking conclusions unwarranted." This work predicts catastrophe, about a generation away, with a point of no return if we go on as we have been. The argument follows the one I mentioned previously, essentially the new Malthusian cause. But, as Kaysen points out, the computer cried W*O*L*F*, for the conclusions lack analytic underpinning, no matter how important the questions raised may be. Thus, the prescriptions are wrong and the urgency with which they are advanced misplaced. There are many more immediate and pressing problems. With Kaysen I think we can all say: "A good sentry does not cry up tomorrow's wolves and ignore today's tigers."