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## URGENTLY NEEDED: A NATIONWIDE APPRAISAL OF THE GROWTH PROBLEM

*F. H. Bormann\**

Ecologists have created a new and powerful force in our political lives, public awareness of an environmental crisis. This awareness senses a decline in the quality of life and a threat to the very basis of life itself caused by the juggernaut of growth in technology and population.

The issue has been quickly captured by hosts of expert linear thinkers, engineers, economists, politicians, biologists, and even some ecologists, who were quick to tell us that they knew the problems and that the cure merely required the application of more money and technology. Their efforts, marked by faith in the power of the invisible hand and by a reluctance to question assumptions underlying the modern industrial state, have shaped and continue to shape governmental policy concerning the world-wide environmental crisis.

Ecologists have tended to view the environmental crisis in terms of parts per million of SO<sub>2</sub> or DDT, or loss of species, or eutrophication or other physical or biological terms. These terms or indices are basic measures of the environmental crisis, but they are not indices commonly used to evaluate the quality of life. They are instead regarded as scientific abstractions quite apart from the daily experience of life, that is, as measures of something that "they" can take care of, and will.

Failure to connect ecologic indices to sociologic indices has generated deep conflict within the environmentalist's camp, and today we are often presented with the paradox of choosing between clean air and water *or* rebuilding the cities and the human landscape. Charges of ecologic elitism are beginning to fill the air.

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The crisis involves not only the physical and biological environment surrounding man; it involves the very core of his existence—the way he thinks, the way he relates to nature and to his fellow men. We live not by bread alone; in fact our concepts of reality may be equal in importance to reality itself. Our well-being is anchored to these concepts, and it is they that are crumbling under pressure of kaleidoscopic environmental changes.

Let me illustrate by drawing an example from mythology—the American dream. Three hundred and fifty-two years ago, the Pilgrims put their feet on a seemingly limitless expanse of North America. America was conceived to offer the promise of work, freedom of action, confidence, self-respect, mobility, and many paths to individual fulfillment. For over three hundred years, this conception or dream has been a driving force for Americans, and despite contradictions, flaws, ordeal, and errors, the American dream has provided inspiration and a basis for action for peoples throughout the world.

Over recent decades, however, the credibility of our dream has steadily eroded, our national luster has dimmed, our faith in ourselves has been shaken, and, in fact, the American dream is in shambles, itself the object of vituperative attack by hosts of disillusioned people both within and without our borders.

What has happened? I suggest to you that the American dream, based as it is on the concept of unlimited space and resources, has run aground on the natural limits of the earth. It had foundered on the shoals of the steadily emerging environmental crisis, a crisis broadly defined to include not only physical and biological factors, but the social consequences that flow from them.

The American dream, so long an energizing force in our society, is withering as social and ecological costs, generated by decades of relative neglect, steadily close in on gains generated by “rugged individualism.” This change has occurred so rapidly that the apparatus of cultural adaptation has failed to keep pace and mold new mythologies; we find ourselves rudderless, drifting on a turbulent sea.

The clash between cultural adaptation and the accelerating environmental crisis is not an exclusive American problem, but rather a problem for all mankind. It transcends national boundaries and is, unquestionably, a global phenomenon. The impact of the environmental crisis, which could just as well be called the cultural crisis, varies from culture to culture, nation to nation, place to place; but together these impacts sum to a global crisis. Symptoms, both ecological and social, are apparent in almost every country on the earth:

air and water pollution, chemical pollution of food chains, decay of cities, chronic food shortages and starvation, increasing drug abuses and alcoholism, rising rates of juvenile delinquency, crime, suicide, and a sense of hopelessness that transcends national borders and political systems.

The enormous dimensions of the environmental crisis in time and space make it difficult for us to perceive the nature of the problem and its causes, not to mention solutions. In many respects, we are like the proverbial blind men trying to reconstruct the elephant. Yet, in any attempt to understand root causes of the global environmental crisis, several factors, tied together in a highly interactive fashion, stand out.

At this moment in human history, we seem to be locked into a positive feedback situation on a global basis. In nature, stability is maintained by arrays of negative feedback controls. Thus, when a forest goes out of dynamic balance because of an outbreak of pests, other elements in the forest, such as predators, will bring it back to the norm. If mature vegetation is destroyed and massive amounts of nutrients and water begin to leak out of the ecosystem, specially adapted successional species will invade and, by their rapid growth, soon move the situation toward conditions that prevailed in the mature forest. In positive feedback situations, the interlocking elements of the system tend to reinforce one another and cause the interaction to speed up. Obviously, this cannot continue forever, and ultimately the system either collapses or some negative feedback mechanism takes over.

Globally, we seem to be locked into a positive feedback situation involving five principal factors that feed upon and reinforce each other. *One*, universal commitments are made by governments to policies that emphasize maximal economic growth. *Two*, the need for growth policies is sustained by ever increasing consumption. Increasing consumption is dependent on, *three*, growing human population and, *four*, rising per capita consumption in some countries; *five*, as a result, rapidly growing technology is required to meet necessary and imagined demands of populations and individuals. The loop is closed by commitment to policies that will sustain economic growth. The view prevails that problems can be met only with a higher national growth rate and the creation of new assets—that the so-called growth dividend is the only glue that can keep nations from becoming unstuck.

The enormous rate of positive feedback is seen in the fact that about four percent of all people who have ever lived are alive today, and their number will double in about thirty-five years. Most of

man's consumption of fossil fuels has occurred in the past twenty-five years, and projections for petroleum indicate that consumption will double in about eleven years. These statistics are an expression of exponential growth which possesses the characteristic of behaving according to a "doubling time." Each fixed time interval shows a doubling of the relevant item. Exponential growth is treacherous and misleading. An item can continue through many doubling times without seeming to reach significant size. But then, in one or two additional doubling periods, the item seems suddenly to become overwhelming. For many environmental variables, such as energy, water-use, fertilizer, and population, this is our present condition.

The growth of populations and technologies as fostered by national policies of economic growth, the lack of effective policies to control population growth, and the lack of effective concern over the broader aspects of the quality of life are generating huge pressures on the global environment. We might think of these as pressures on our natural resources, on our life support systems, and on our psychosphere.

The earth as a place to live has a limited amount of air, water, soil, minerals, space, and other natural resources, and today we are pressing hard on our resource base. This pressure is most obvious regarding our food resources as two-thirds of the world's population lives close to the subsistence level. The green revolution promises some temporary relief, but even this is subject to question. For even a temporary success of the green revolution, the new high-yielding grains must be accompanied by swift economic and cultural changes. Others question the very philosophy of the green revolution which seeks to impose a western agriculture which is, itself, subject to increasing criticism for its pursuit of short-term economic gain at the expense of long-term ecologic and social cost. At any rate, there is increasing agreement that, without sizable reduction in population growth rates, within several decades natural limits on agricultural productivity of the earth will bring convulsive reductions in the size of human populations. Pressures on many other aspects of world resources are also evident and need not be reviewed here except to point out that by the year 2038, only as far in the future as the invention of the airplane is in the past, current rates of consumption of useful metals will have exhausted perhaps half of the known reserves.

Man, rich or poor, is utterly dependent on his global life support system. Day after day, we depend on the proper functioning of natural cycles such as the hydrologic, carbon, and nitrogen cycles,

the self-regulating features of natural ecosystems, and the normal energy relationships of the earth. Although history is littered with examples of countries ruined by poor environmental policies, until a few decades ago most of us thought that the overall function of the biosphere was immune to human disturbance and that human error was limited to individual countries. The advent of the nuclear age changed all that when clouds of radioactivity ignored national borders and spread unrestricted over the surface of the earth. Now, evidence is accumulating that we are altering the biosphere in many ways. Subtle changes in climatic relations of the earth may be under way due to increases of carbon dioxide or atmospheric turbidity resulting from industrial and agricultural pollution; the stability of regional and world ecosystems is probably being weakened by the introduction of pesticides, acid rain, heavy metals, and other pollutants, and by the evermore widespread simplification of nature.

Each year, millions of acres, including much productive agricultural land, are consumed by spreading urbanism; each year, more of the world's wetlands and estuaries are destroyed or severely altered by pollution or by competing land uses; and each year, forests and vegetation increasingly distant from sources of pollution are killed or simplified by air pollution. Nature is progressively further contracted by thousands of less spectacular insults we inflict on the earth each day.

It is necessary to point out that pressure on our global life support system is closely related to our rush for additional and cheap natural resources. Strip mining for coal has devastated hundreds of square miles of landscape. Demands for more energy force us to go ahead with construction of energy plants, both fossil and nuclear, before we can see the full implications of what we are doing. Exploitation of the sea bottom as a source of natural resources is accelerating with only the vaguest notions of how these activities will affect the ecology and productivity of the sea.

The psychosphere is the source of all psychic inputs that determine patterns of thought and behavior, interactions between men, between man and nature, and one's opinion of oneself. It is hard to measure the psychic effects of growing population and technology particularly since effects vary according to regions, cultures, and subcultures. For us in the United States, actions taken in the pursuit of material progress must have a profound, if subtle, effect. Our psychosphere is impoverished by the progressive degradation of our environment. Every day, all of us are assaulted, directly or subliminally, by the spectacle of decaying cities, gargage-strewn country-

sides, tasteless strip developments, filth-laden streams and lakes, aggravating transportation snarls, choking air, incessant noise, and by a callous disregard for all other organisms that share our planet.

More subtle are other costs of sustained economic and technologic growth. All of us feel a rising anxiety because we live close to the brink of obsolescence and because ever growing technology needs to create disaffection with present conditions to promote ever greater consumption. The dignity of labor has declined because two centuries of technological innovation, in the name of efficiency, has reduced artisans, craftsmen, and clerks into machine minders. This is because labor is considered a disutility while all output is considered a utility; hosts of efficiency experts work hard at reducing the ratio of labor to output without the slightest regard for social consequences. Further, things that tend to get done in modern industrial society are those things that are particularly conducive to economic growth. This is almost the sole consideration determining the crops we sow, the style of our houses, the shape of our cities and landscapes. The result, among other things, is the dreariest possible uniformity.

In sum, the technologic conditions of industrial, business, and agricultural production evolve in response to output efficiency and are not chosen to enhance man's experience of life. The predominant influences bearing on man's welfare are thus generated accidentally, and are simply byproducts of technologic advance. This is not to deny the benefits in goods and services that man receives from technologic advance, but rather to underline that other pervasive influences on his welfare arise from so-called technologic advances. These affect him directly as a worker who responds passively to evolving machinery. Technology also affects him indirectly, though critically, by its ultimate determination of the matrix of society, by its effect on our natural, institutional, and psychological environment which constrains and fashions our personalities.

Man's capacity to utilize natural resources, to affect global life support systems, and to alter the human psychosphere is increasing faster than man's realization and understanding of the profound changes he is capable of making in the world.

Obviously, this cannot go on forever. Sooner or later, limiting factors will halt the growth syndrome. The major question is whether or not control of the growth syndrome will be achieved by rational, carefully planned human action or by the sledgehammer blows of factors quite out of human control such as massive famine, epidemic disease, decay of the social structure, destruction of some vital aspect of the life support system, or simply by nuclear war.

The crisis is so all-pervasive and growing so rapidly that present political and technological approaches must be regarded as only temporary palliatives. Proposed solutions, such as removing phosphorus from detergents or devising exhaust emission controls, are formulated not in the light of problems, but from a timorous understanding of what may or may not be immediately feasible. However, given the mind-boggling complexity of the problem, our very incomplete understanding, and the general intransigency of thought at all political levels, I suspect that actions and changes in the 1970's will be fundamentally restricted to the kind we are now seeing. Let us hope that activists, ecologically-minded citizens and politicians working through the courts, the legislature, and the media will keep the pressure on, and will force as much change as possible within the context of our present growth orientation. However, I think we must recognize that these actions represent, at best, a holding operation, a purchase of time, a slow down in the rate of increasing environmental degradation. Given the exponential growth rates of technologic and population based problems, I suspect that within a decade, the realization will be clear to all that the main problems of the environment do not arise from temporary and accidental malfunctions of existing economic and social systems. On the contrary, they will probably be seen as warning signs of a profound incompatibility between deep-rooted beliefs in continuous growth and the dawning recognition that the earth is limited in its resources and vulnerable to thoughtless mishandling.

Will we be able to abandon or vastly scale down or redirect our commitment to growth and affect fundamental changes in our economy, to reorder our psychic and ecologic environment? The implications of such changes are huge. Not only would they affect industry, labor, business, government, income groups, minority groups, and international relationships, they would affect the very way we think, the way we relate to each other, and the way we relate to nature. It is most unlikely that people on focal points of political power will work for change involving such drastic reorganization of society unless they are energized by a vision, clearer than that which now exists, of what life might be like under the new conditions. It seems to me that the creation of that vision is the awesome challenge of the 1970's.

The search for new vision has begun. The controversial publications *Limits to Growth* and *Blueprint for Survival* question the wisdom of continued commitment to an unrestrained growth economy and call for new alternatives. Although these works provide a



starting point for discussion, they must be regarded as preliminary analyses. We need a comprehensive national discussion of the growth problem, and how it relates to our philosophy, our society, our economy, our virtues and faults and our potentialities. This discussion must not be restrained by the neo-Keynesian view of what is and what is not immediately feasible.

Direction and purpose could be gained by the formation of tens or hundreds of survival congresses composed of workable numbers of specialists and laymen from all disciplines and segments of society. It is important that these congresses contain humanists, for there is a potential dark side to solutions of the technology—population problem; they may ignore basic questions of equality and freedom. Some of these congresses would be quite sophisticated and require extensive funding to support computer costs; others could be done on a shoestring, with every university or college supporting one. Each congress could choose its own area of analysis such as the biosphere, international relations, agriculture, economics, transportation, minority groups, national, regional or city planning, the neighborhood or the family. Congresses would then explore the potential effects of continued growth, restricted growth, or no growth. They would seek means that would allow man to enjoy the fruits of a technology in harmony with the biosphere. They would attempt to uncover potentialities that existing institutions either ignore or bury beneath a crust of custom or habit. They would project new patterns of life and politics where all citizens are guaranteed equality and freedom, a decent environment, diversity, and a maximum opportunity for individual fulfillment, and they would design pathways by which these goals could be achieved without apocalyptic social disruption.

This proposal will be seen as a call for utopian thinking, which it is. The charge can well be made that the road to boredom and serfdom has been paved with utopian illusions, but past utopians have provided both a spiritual and conceptual force that has been an energizing force for later social change. Universal suffrage, separation of the powers of government, and the basic ingredients of the welfare state were first suggested by utopian thinkers.

The goal then of these congresses is to arouse us to new social possibilities, to prepare the way for fundamental change by formulating new patterns of life emphasizing humanism and harmony with ecological principles, and, by widespread communication, to create the necessary receptivity for basic change to occur. At first, our

national discussions may appear as sterile exercises, and will be so disparaged by self-proclaimed realists. But as the growth syndrome generates ever-greater pressures on our world, concepts of reality will change and we will look more toward a new reality, a reality emphasizing man in harmony with nature. To design that harmony should be the great objective of the 1970's.