The basic scientific fallacies of the Global 2000 reports

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The *Global 2000 Report to the President,* a two-volume document published by the Government Printing Office in 1980, does not claim to be a scientific study of the consequences of human population growth. It is thus methodologically different in a fundamental way from previous tracts expounding the same Malthusian world view, like *The Limits to Growth.* Many studies like *Limits to Growth* have gone to great lengths to convince decisionmakers that progress, industrial expansion, and technological development were temporary fluctuations in man's history, that the eventual, and natural, state of the human species is a "steady-state" equilibrium with nature. These studies have consistently argued from the standpoint of science and objective reality. The fact that the studies were fraudulent, shoddily executed, and ideologically motivated is a secondary point: they attempted to argue from necessity (a false necessity, to be sure) that human population growth and economic growth must be halted.

The *Global 2000 Report* has dropped the pretense of science. It is a bald statement of policy, of intent. The authors of this document describe in detail the policies of capital investment, agricultural development, economic planning, and scientific research that they expect to implement.

The policy outlook

A causal analysis of the world economy shows that the fundamental dynamic of economic change in a system made up of two sectors of vastly different levels of productivity, living standards, and economic scale is determined by investment decisions affecting three areas of economic activity:

1. **Growth rates in the more advanced sector,** which at present decisively shape the potential of the world as a whole to grow in the next 20 years.

2. **Rates of technological change,** including technology transfer to the less-developed sectors, and, in the long run more important, creation of qualitatively new technologies. These processes determine the ability of the entire economic system to survive. The second process, the rate of technological change, is the primary determinant of the population potential of our planet at any given time, and the only rigorous basis for discussing population size.

3. **Infrastructure development in the less-advanced sector.** The introduction of technology requires a large, initially unproductive investment in "infrastructure." The introduction of electricity depends on delivery systems (transmission cables, wiring in buildings, maintenance of backup sources of power, etc.) which are expensive, redundant from the standpoint of existing power networks, and capital-intensive. Huge investments are required for irrigation, public health, energy delivery, and transportation in almost every underdeveloped country; but these investments will not "pay off" until these countries reach a considerably higher economic level. It turns out that these projects return many times their initial costs, of course, but from a short-term financial or credit standpoint, they represent losses.

The *Global 2000 Report* specifies policies for each of these areas. It does not claim that the policies chosen are unique or necessary, merely that they are the policies to be carried out by the powers that be.

Growth rates

The authors of the report recognize the central role played by the assumed growth rates of the advanced sector of the world economy. The *Global 2000* authors choose growth rates for the advanced sector consistent with their policies of conservation and deindustrialization—growth rates lower than the World Bank and other studies. "In both scenarios, all GNP growth rates were reduced by roughly 10 to 30 percent for the period 1985-2000 . . . to take into account the future impact of declining population growth rates on GNP growth. . . . It should be noted that the WAES [the source of the *Global 2000* GNP statistics] high-growth case corresponds approximately to World Bank midlevel projections for the 1976-1985 period" (Vol. II, pp. 521-522).

The assumption of low rates of growth in the more advanced sector is combined in the report with a set of related policy statements on financial and credit requirements of the less-advanced sector:

1. **Economic development in the less-advanced sector is decoupled from the advanced sector.** "[In the model] LDC economic growth rates have no impact on the growth rates of the industrialized nations, which, in turn, are not projected to have any impact on the ability of the industrialized nations to invest in the LDCs" (Vol. II, p. 525). This policy statement claims that there is no economic rationale for investment in the less-developed sector—it cannot possibly pay for an advanced-sector nation to invest in a less-developed nation if the successful realization of that investment will have no "impact on the ability of the industrialized nations to invest in the LDCs."

2. **There will be no change in the financing and credit relations between the two sectors.** As the report says: "The model thus implicitly also assumed that the existing economic system and associated financial institutions and facilities are fundamentally sound. . . . These assumptions may seem to imply that the recent demands of the LDCs for a 'new economic order' will not be met; Simlink [the model used by the *Global 2000 Report*], however, was not designed to analyze this issue. Such a new economic order would involve major changes in the structure of world industry, a new international division of labor, and a dramatic shift in the relative influence of the Western world on the international economic system" (Vol. II, p. 526).

3. **Low prices for raw materials and unprocessed exports from the less-developed sector.** The *Global 2000* authors consistently assumed that the result of the low growth rates projected in the study would be stable or even declining prices for the major exports of the less-advanced sector (Vol. II, p. 530). The combined effect of this low price policy and low import-demand policy on the part of the more-advanced sector is, of course, a dramatic drop in the purchasing power of the less-advanced sector.

4. **High energy prices.** Although there is no economic or technical basis for the assumption of rising energy prices given the demand and consumption pattern assumed by the report's authors—in fact, recent data show that over the last six months a significant drop in petroleum imports has resulted in a glut on the world oil market, a steady fall in the oil spot-market price, and official price decreases in absolute terms by OPEC suppliers—the report assumes a 5 percent per annum rise in the price of petroleum. This policy determination to maintain high oil prices is felt by the less-developed sector in terms of their increasingly negative balance of payments.

All these assumptions are statements of policy. There is no necessity for *any* of these assumptions to shape economic reality over the next two decades unless that is the policy enforced.

Once these policies are assumed, however, the *Global 2000 Report* describes the economic consequences: "It was assumed that not all LDCs could experience optimal circumstances simultaneously. . . . Several LDCs are likely to experience negligible per capita economic growth and possible decreases in per capita consumption over the 1985-2000 period. This would be in contrast to recent historic trends, as well as to LDC expectations and might produce severe social and political tensions, which are also not represented in the model" (Vol. II, p. 526).

The conclusions drawn concerning economic growth follow from these economic and financial policies. Major sections of the world have static or declining consumption levels. Bangladesh, Pakistan, India, most of central Africa (sub-Sahara, non-OPEC), all will be consuming less per person in 20 years than they do today if these policies are carried out! Countries which today have a per capita income of less than $200 will be no better off in 20 years than they are today.

Rates of technological change

In many places in the *Global 2000 Report,* the authors note the importance of technology and technological innovation. However, in keeping with the central import of their policy statements, they systematically exclude fundamental changes in technology. They explicitly rule out, for example, the development and implementation of nuclear fusion, major breakthroughs in agricultural technology, and dramatic improvements in industrial technology. These assumptions are, in fact, statements concerning policy in the more-advanced sector for research and development spending, investment in basic science, and advanced education.

However, the economic development of the world over the next 20 years can be accomplished even without major technological innovation; several studies have shown that a carefully structured investment program can take even a country as large as India and, using only off-the-shelf technology, successfully industrialize it.

The *Global 2000 Report* rules out even this possibility. In the areas of energy, agriculture, and industrial production, the less-developed sector continues to suffer, in the Global 2000 projections of policy, from inadequate and inappropriate technology. The technology transfer forecast for agriculture in the report shows this policy in its most grisly detail. The basic policy dictate they formulate is one of insufficient investment:

> All three alternatives [of agricultural investment] indicate that projecting food balances to the year 2000 is a question not of capacity alone but also of private and public cost. *The projection results . . . suggest that the world's productive capacity is more than adequate to meet the largest foreseeable increases in demand to the end of the century.* However, real food prices are projected to increase

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Mechanization and genetically engineered wheat in India.

> even if the price of inputs from outside the agricultural sector remain constant. . . . A number of recent studies conclude the earth's physical resources and expanding technology can sustain a 4 to 6 percent rate of growth in food production. Realizing even the 2.1 percent growth to 2000 . . . however, will entail higher real costs and increased pressures on the world's resource and environmental balances. . . . The environmental difficulties likely to be associated with the projections outlined above appear to be manageable in theory. Management options within the agricultural sector are wide enough, particularly if supplemented with environmentally sensitive technology, to solve the problems inherent in using a larger proportion of the world's resources in an increasingly intensive manner to produce food [emphasis added] (Vol. III, pp. 96-101).

In other words, there are no technical or "natural" impediments to increasing food production much faster than population, yet the policy described by the report provides for a minuscule increase in global food per capita. In fact, the *Global 2000* authors actually intensify the inequalities and insufficiencies of agricultural production. The result of these policies, according to the report, is astounding: an *18 percent decline* in the food consumption of large parts of Asia and Africa. These devastating results are not due to any limits on arable land, water, fertilizer, or energy; even the authors admit that the environmental considerations are manageable. The starvation predicted in the report is solely a result of the investment policies specified in the report. The sponsors of *Global 2000* announce that they *refuse to make* the requisite investment to sustain population growth. Therefore, up to 2 billion people will be eliminated.

The infrastructure question

As noted above, infrastructural development—transportation networks, communications, health-care delivery, water and sewage systems, and energy delivery—has traditionally been the most expensive and economically problematic aspect of world development. This infrastructure is especially crucial for urbanization, i.e., for the absolutely necessary demographic shift from rural to urban life. The long payback times inherent in these investments, the indirect nature of the benefits they provide, and their non-exportability have helped to make the rate of infrastructure growth tortuously slow. In countries where these investments were made, however, like South Korea (or the United States), subsequent economic growth has repaid the investment many times over. But these investments could only be made with long-term credits; a 10-20 year maturity on credit for infrastructure development is critical for its success.

The *Global 2000* authors foresee a different investment strategy for the less-advanced sector. In these areas of critical infrastructural development they prescribe policies that will actually lessen the delivered services in these countries:

There is reason to question whether the needed improvements in sanitary and environmental conditions will occur. By the year 2000, sanitary conditions in some areas may even deteriorate. This situation [will be] worsened by increasing scarcities of food and energy in poorer regions. . . . The largest impacts on LDC health, however, may occur in the urban areas. Over the last quarter of this century the urban population of the world is projected to increase from 39 percent to almost 50 percent. The largest increases will occur in LDC cities. Mexico City is projected to increase from 10.9 million in 1975 to 31.6 million in 2000, roughly three times the present population of metropolitan New York City. . . . Altogether it is projected that 1.2 billion additional persons—roughly a quarter of the present total world population—will be added to LDC cities, and the most rapid growth will be in uncontrolled settlements where populations are now doubling every 5-7 years. Financial resources are not likely to be available to the poor in uncontrolled settlements or to their city governments, even for providing safe water. Sewage facilities will be limited at best. Fecally related diseases can be expected to increase. The forestry and energy projections suggest that warm, dry, uncrowded housing will be even less available than now—a condition that will foster the transmission of contagious diseases (Vol. III, pp. 249, 426).

Again, the authors make no claim that these results are due to anything but lack of investment. Population growth, land area, technology are not determining factors; it is purely a question of policy.

The authors of the report, at this point in their argument, note one consequence of the decay of infrastructure in the less developed sector: population growth slows dramatically! They remark on this in the summary volume:

[There are] new data suggesting that fertility rates in some areas have declined a little more rapidly than earlier estimates indicated. The new data indicate that fertility declines have occurred in some places even in the absence of overall socioeconomic progress. Between 1970 and 1976, for example, in the presence of extreme poverty and malnutrition, fertility declines of 10-15 percent occurred in Indonesia and 15-20 percent in the poorest income classes of Brazil. . . . [New data exist showing] that in recent years declines in mortality have not been as great as those anticipated by the United Nations in certain countries, especially LDCs. In most cases, these revisions have been reviewed by the United Nations, and future U.N. projections are expected to reflect the slower progress in mortality reduction encountered in recent years(Vol. III, p. 513).

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Stated in plain English, the authors of the *Global 2000 Report* say that their policy projections mean that people will die younger. The fall in fertility rates is due, they note with clinical interest, to higher infant mortality, lower conception rates, and less frequent intercourse that accompany "extreme poverty and malnutrition." The increase in mortality rates or shorter life expectancies is due to their projection of insufficient investment in health care. This decline in life expectancies is shocking: the life span of an average Indian decreases by 6.5 years (from its estimate using more optimistic projections of health care); of an average Mexican by 2 years; and an average Pakistani by 4.2 years.

The revisions in the vital statistics of the less-developed sector made a significant change in the projected population of the world by 2000. The original estimate of 6.35 billion people was decreased to 6.18 billion. This drop of 170 million people represents 10 percent of the projected population increase between the present and the year 2000.

The authors of the *Global 2000 Report* project policies whose minimum impact is the unnecessary death of 170 million people. They know and describe the investments that could be made to save these people and explicitly reject them. They do not claim that the food could not be grown, that the health care not be provided, the housing not built—they simply reject the policies that might provide these necessities. That 170 million people die as a result—an unfortunate by-product, these gentleman say regretfully, but a necessary

consequence of policy.

Six months after publishing the *Global 2000 Report,* the Council on Environmental Quality published a volume devoted solely to their policy recommendations for the problems analyzed in the *Global 2000 Report.* This volume, called *Global Future: A Time to Act,* completes the study that the *Global 2000 Report* began. *Global 2000* purports to be an impact study, *Global Future* a set of policy alternatives.

Global Future addresses the basic causes of world problems—the causes as analyzed by the *Global 2000 Report*—by first implicitly making the same assumptions about the world's financial and credit structure. Nothing changes in the three determinative areas of advanced-sector growth rates, technology transfer, or infrastructure development. In fact, *Global Future* explicitly cautions against high growth rates in the advanced sector (it lauds conservation and wise consumption by the "greedy and rich" more-advanced sector); it warns about the dangers of nuclear proliferation, and strongly recommends the "appropriate technology" strategy of technology control; it advocates only the most minimal investments in health care or other infrastructure.

Instead, it proposes "population control." There will be too many people by the year 2000, the CEQ assures us. Population growth is outstripping our ability to grow food, provide housing, improve health care. Mankind is "threatening the balanced environment for all other animals." The only solution raised by the *Global Future* authors is depopulation.

The reader must be absolutely clear about the structure of the argument: Both *Global 2000* studies begin by assuming the necessity of the policies of low growth, technology control, and lack of infrastructure—policies the reports' sponsors have imposed for at least a decade. Once these policies are given, of course, the world faces a population crisis; population control is the only way out. Either people are prevented from multiplying too fast by an aggressive program of sterilization, contraception, and abortion, or they will die by means of famine and violence. The *Global 2000* authors propose population reduction by any means necessary.

A more extensive version of this article will appear in the September 1981 issue of Fusion *magazine. In addition to the material presented above, it will contain a discussion of how to scientifically determine what population density, based on population potential, can and should be. Unlike* Global 2000, *which designates people as consumers rather than producers, Dr. Bardwell shows that in an industrializing economic system, the entire population can become productive individuals adding net wealth to their nation, and that in many regions there will be acute problems of* underpopulation *relative to development capacity.*

Documentation

Excerpts from the Global 2000 report

The following excerpts are from the concluding section of Volume I of the Global 2000 Report, *pages 39-42.*

The world in 2000 will be different from the world today in important ways. There will be more people. For every two persons on the earth in 1975 there will be three in 2000. The number of poor will have increased. Four-fifths of the world's population will live in less-developed countries. Furthermore, in terms of persons per year added to the world, population growth will be 40 percent *higher* in 2000 than in 1975.

The gap between the richest and the poorest will have increased. By every measure of material welfare the study provides—per capita GNP, and consumption of food, energy, and minerals—the gap will widen. . . .

There will be fewer resources to go around. While on a worldwide average there was about four-tenths of a hectare of arable land per person in 1975, there will be only about one-quarter hectare per person in 2000. By 2000 nearly 1,000 billion barrels of the world's total original petroleum resource of approximately 2,000 billion barrels will have been consumed. Over just the 1975-2000 period, the world's remaining petroleum resources per capita can be expected to decline by at least 50 percent. Over the same period world per capita water supplies will decline by 35 percent because of greater population alone; increasing competing demands will put further pressure on available water supplies. The world's per capita growing stock of wood is projected to be 47 percent lower in 2000 than in 1978.

The environment will have lost important life-supporting capabilities. By 2000, 40 percent of the forests still remaining in the LDCs in 1978 will have been razed. The atmospheric concentration of carbon dioxide will be nearly one-third higher than pre-industrial levels. Soil erosion will have removed, on the average, several inches of soil from croplands all over the world. Desertification (including salinization) may have claimed a significant fraction of the world's rangeland and cropland. Over . . . 15 to 20 percent of the earth's total species of plants and animals will have become extinct . . . . at least 500,000 species.

Prices will be higher. The price of many of the most

vital resources is projected to rise in real terms—that is, over and above inflation. In order to meet projected demand in line with anticipated supplies, the real price of energy is assumed to rise more than 150 percent over the 1975-2000 period. Supplies of water, agricultural land, forest products, and many traditional marine fish species are projected to decline. . . . Resource-based inflationary pressures will continue and intensify, especially in nations that are poor in resources or are rapidly depleting their resources.

The world will be more vulnerable both to natural disaster and to disruptions from human causes. Most nations are likely to be still more dependent on foreign sources of energy in 2000 than they are today. Food production will be more vulnerable to disruptions of fossil fuel energy supplies and to weather fluctuations as cultivation expands to more marginal areas. The loss of diverse germ plasm in local strains and wild progenitors of food crops, together with the increase of monoculture, could lead to greater risks of massive crop failures. Larger numbers of people will be vulnerable to higher food prices or even famine when adverse weather occurs. The world will be more vulnerable to the disruptive effects of war. The tensions that could lead to war will have multiplied. The potential for conflict over fresh water alone is underscored by the fact that out of 200 of the world's major river basins, 148 are shared by two countries and 52 . . . . by three to ten countries. Long-standing conflicts over shared rivers such as the Plata (Brazil, Argentina), Euphrates
(Bangladesh, India) could easily intensify.

Finally, it must be emphasized that if public policy continues generally unchanged the world will be different as a result of lost opportunities. The adverse effects of many of the trends discussed in this study will not be fully evident until 2000 or later; yet the actions that are necessary to change the trends cannot be postponed without foreclosing important options. The opportunity to stabilize the world's population below 10 billion, for example, is slipping away; Robert McNamara, president of the World Bank, has noted that for every decade of delay in reaching replacement fertility, the world's ultimately stabilized population will be about 11 percent greater. Similar losses of opportunity accompany delayed perceptions or action in other areas. If energy policies and decisions are based on yesterday's (or even today's) oil prices, the opportunity to wisely invest scarce capital resources will be lost as a consequence of undervaluing conservation and efficiency. If agricultural research continues to focus on increasing yields through practices that are highly energy-intensive, both energy resources and the time needed to develop alternative practices will be lost.

The full effects of rising concentrations of carbon dioxide, depletion of stratospheric ozone, deterioration of soils, increasing introduction of complex persistent toxic chemicals into the environment, and massive extinction of species may not occur until well after 2000. Yet once such global environmental problems are in motion they are very difficult to reverse. In fact, few if any of the problems addressed in the Global 2000 Study are amenable to quick technological or policy fixes; rather, they are inextricably mixed with the world's most perplexing social and economic problems.

Perhaps the most troubling problems are those in which population growth and poverty lead to serious long-term declines in the productivity of renewable natural resource systems. In some areas the capacity of renewable resource systems to support human populations is already being seriously damaged by efforts of present populations to meet desperate immediate needs, and the damage threatens to become worse. . . .

There are no quick or easy solutions, particularly in those regions where population pressure is already leading to a reduction of the carrying capacity of the land. In such regions a complex of social and economic factors (including very low incomes, inequitable land tenure, limited or no educational opportunities, a lack of non-agricultural jobs, and economic pressures toward higher fertility) underlies the decline in the land's carrying capacity. Furthermore, it is generally believed that social and economic conditions must improve before fertility levels will decline to replacement levels. Thus a vicious circle of causality may be at work. Environmental deterioration caused by large populations creates living conditions that make reductions in fertility difficult to achieve . . . while, continuing population growth increases further the pressures on the environment and land.

The declines in carrying capacity already being observed in scattered areas around the world point to a phenomenon that could be more widespread by 2000. In fact, the best evidence now available—even allowing for the many beneficial effects of technological developments and adoptions—suggests that by 2000 the world . . . may be within only a few generations of reaching the entire planet's carrying capacity. . . .

Unfortunately population growth may be slowed for reasons other than declining birth rates. As the world's populations exceed and reduce the land's carrying capacity in widening areas, the trends of the last century or two toward improved health and longer life may come to a halt. Hunger and disease may claim more lives—especially lives of babies and young children. More of those surviving infancy may be mentally and physically handicapped by childhood malnutrition. . . .

Unless nations collectively and individually take bold and imaginative steps toward improved social and economic conditions, reduced fertility, better management of resources, and protection of the environment, the world must expect a troubled entry into the 21st century.