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As a public service, the Laucks Foundation calls attention to published material that might contribute toward clarification of issues affecting world peace, equity among peoples and environmental responsibility.

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A note to our friends and readers: Thank you all for your responses to our inquiry, your suggestions for future topics, and your continuing support for our efforts! We are planning to continue this format in our next series on the meaning and manifestation of class in the United States.

Please note: If you find a star after your name on the mailing label, this will be your last issue unless you let us know that you wish to remain on the list.

We are living in an unprecedented time of population growth and total human numbers. Many instances of long-term damage and stress to the earth's environment and other species have been documented. From this evidence many people conclude that large human populations cause environmental degradation, although others would argue that the data is not yet convincing. Clearly, however, at some level of total human population we must control the growth of our numbers. This necessity leads to ethical dilemmas not faced before, because up until now reproduction has been a species imperative.

We apologize for the fact that this reprint has been so long in process. A year ago when we planned this issue on the ethical questions surrounding human population, we did not realize how hard it would be to find material. We were surprised to find that few authors since the 1970s have attempted to tackle this topic. Apparently, due to the complexity of the population problem—the religious, social, political, and economic aspects—it is increasingly difficult today to find the common ground necessary to discuss the ethical questions. Instead authors focus on the technical aspects of human population, such as population data, resource use, documentation of environmental stress, and proposed solutions.

In this issue we reprint the following articles and excerpts:

1). Entering the Zone by Joel Cohen
Reprinted with permission from *How Many People Can the Earth Support?* (Ch. 17), W.W. Norton & Co (1993).

2). Living on a Lifeboat by Garrett Hardin
Reprinted with permission from BioScience, 24(10):561-568. © 1974 American Institute of Biological Sciences. As reprinted in Stalking the Wild Taboo, 3rd edition, The Social Contract Press, Petosky, Michigan (1996).

3). Ethics and Population Limitation by Daniel Callahan
Reprinted with permission from *Science* 173:487-494 (4 Feb 1972). © 1972 American Association for the Advancement of Science.

4). Sui Genocide
Reprinted with permission © 1998 The Economist Newspaper Group, Inc. *The Economist* Dec.19th 1998, p.130-131. Further reproduction prohibited.

Joel Cohen (Laboratory of Populations at Rockefeller University) offers a summary of the current thinking on how to slow human population growth. None of these approaches is radical, and all are offered under the auspices of some institution. As he quotes Robert Cassen as saying, "virtually everything that needs doing from a population point of view needs doing anyway". Garrett Hardin (Professor Emeritus of Biology, University of California, Santa Barbara) presents a disturbing argument on the implications of environmental limits for the conduct of wealthy nations towards poor nations. He argues that food aid to poor countries during crises and liberal immigration policies in wealthy nations are both misguided and irresponsible policies in the long term. Daniel Callahan (Institute of Society, Ethics and the Life Sciences, Hastings-on Hudson, NY) wrote the reprinted article in 1972, but it remains relevant today as a thoughtful discussion of the ethical issues confronted by a government which attempts to control an individual's decision to reproduce. Sui Genocide appeared in a recent Economist and we reprint it, tongue in cheek, as an endnote to this series.

Entering the Zone

Joel E. Cohen

No species has ever been able to multiply without limit. There are two biological checks upon a rapid increase in number—a high mortality and a low fertility. Unlike other biological organisms, man can choose which of these checks shall be applied, but one of them must be. —Harold F. Dorn 1962 [1]

Recapitulation

The human population of the Earth now travels in the zone where a substantial fraction of scholars have estimated upper limits on human population size. These estimates are no better than present understanding of humankind's cultural, economic and environmental choices and constraints. Nevertheless, the possibility must be considered seriously that the number of people on the Earth has reached, or will reach within half a century, the maximum number the Earth can support in modes of life that we and our children and their children will choose to want.

This conclusion emerges clearly from the three main elements of the book up to this point: human population history, scenarios of future population and estimates of the maximum number of people the Earth can support (Figure 1).

The history: since 1600, the human population increased from about half a billion to nearly six billion. The *increase* in the last decade of the twentieth century exceeds the *total* population in 1600. Compared to all human history prior to World War II, the world's population growth rate since 1950 has been and still is unprecedented, Within the lifetime of some people now alive, world population has tripled; within the lifetime of everyone over 40 years old, it has doubled—yet never before the last half of the twentieth century had world population doubled within the life span of any human.

The future: human populations, like economies, environments and cultures, are highly unpredictable, and only conditional predictions are

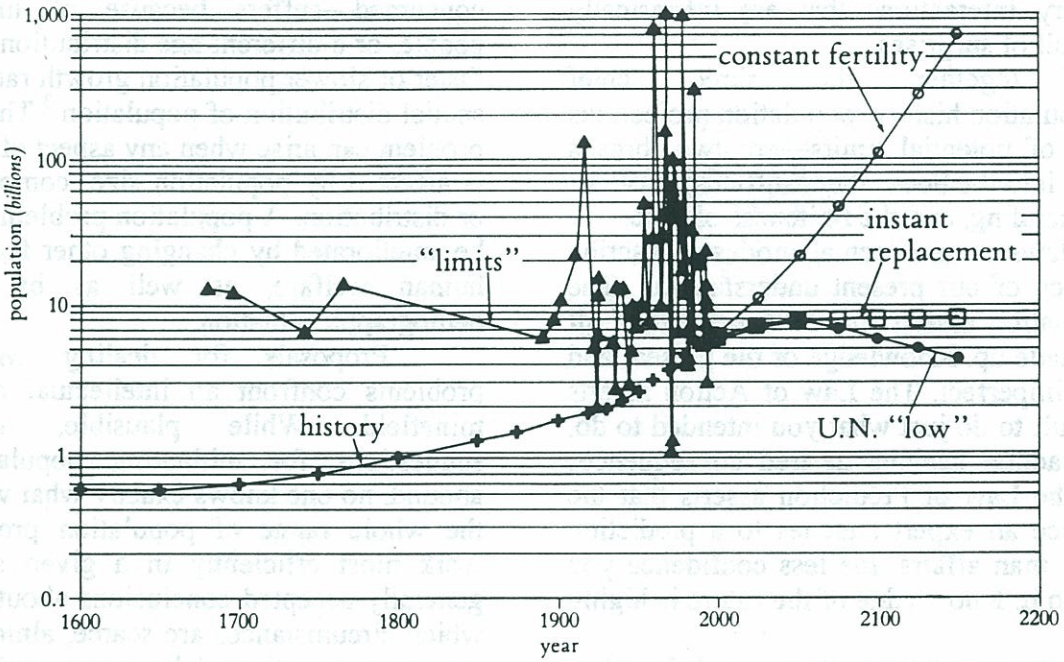

FIGURE 1. Human population size 1600-1990, three United Nations scenarios of future population growth 1990-2150 and estimates of the Earth's maximum human population ("limits") by year of publication 1679-1994. The constant-fertility projection assumes that fertility in each region of the world remains at its level in 1990; in this scenario, the global average total fertility rate rises from 3.3 children per woman in 1990 to 5.7 children per woman in 2150 as the faster-growing regions become a larger share of world population. The instant-replacement projection assumes that the total fertility rate dropped to 2.06 children per woman in 1990 and remains at that level. The low-fertility projection assumes that the total fertility rate gradually moves to 1.7 children per woman everywhere. By the year 2050, according to these three projections, the world's population would number 21.2 billion, 7.7 billion and 7.8 billion. The plotted estimates of the Earth's maximum human population are the highest given when an author stated a range. SOURCE: for history, Appendix 2 (How Many People Can the Earth Support); for future scenarios, Table 8.2, Ibid.; for "limits," Appendix 3, Ibid.

credible. In the United Nations' high projection published in 1992, if worldwide average fertility falls to 2.5 children per woman in the twenty-first century, then population will grow to 12.5 billion by 2050. In the United Nations' 1992 low projection, if worldwide average fertility falls to 1.7 children per woman, population will peak at 7.8 billion in 2050 before beginning to decline. The projected range for 2050 is 12.5 billion to 7.8 billion.

The Earth's human carrying capacity: estimates range from fewer than 1 billion to more than 1,000 billion. This enormous spread follows from widely varying concepts, methods and assumptions. Estimates fall most frequently in the range from 4 billion to 16 billion. Counting the highest estimate when an author gave a range of estimates, and including all estimates given as a single number, the middle value, or median, of the estimates was 12 billion; counting the lowest estimate when an author gave a range, and the single number otherwise, the middle value, or median, of the estimates was 7.7 billion. These static and deterministic estimates are inadequate to picture human-planetary interactions that are intrinsically dynamic and full of surprises.

Tying together the three chief elements—population history, population projections and estimates of potential limits—are two threads that are woven into the book: the insufficiency of our present understanding, and the finiteness of time.

Three laws of intellectual modesty describe the insufficiency of our present understanding. The Law of Information asserts that 97.6 percent of all statistics are made up. Knowledge of the present and past is highly imperfect. The Law of Action asserts that it is difficult to do just what you intended to do. Action and inaction achieve desired consequences imperfectly. The Law of Prediction asserts that the more confidence an expert attaches to a prediction about future human affairs, the less confidence you should attach to it. Knowledge of the future is highly imperfect.

The finiteness of time, the second thread in the book, limits the abilities of individuals and of societies to solve problems. For each human being, time is finite. I want to eat and drink today. As a privileged inhabitant of a wealthy country, I can postpone buying a new car for several years, but the requirements of poor people for subsistence are not so elastic in time. Those who want firewood to cook a meal today will break branches from the last tree standing if they believe that otherwise their children may not survive to lament the absence of trees 20 years hence. In the American legal system, the finiteness of time to satisfy basic human wants is recognized in a phrase: justice delayed is justice denied.[2]

Efforts to satisfy human wants require time, and the time required may be longer than the finite time available to individuals. There is a race between the complexity of the problems that are generated by increasing human numbers and the ability of humans to comprehend and solve those problems. Educating people to solve problems takes time. Developing traditions of stable, productive cooperation takes time. Building institutions with the resources to make educated people into productive problem-solvers takes time. Even with educated, cooperative people and appropriate institutions at hand, understanding and solving problems take still more time.

Dealing with Population Problems: Bigger Pie; Fewer Forks; Better Manners

A population problem arises whenever human welfare—any value held by the people concerned—suffers because of more or fewer people, or a different age distribution of people, or a faster or slower population growth rate, or a changed spatial distribution of population.[3] Thus a population problem can arise when any aspect of human welfare is affected by population size, composition, change or distribution. A population problem can sometimes be ameliorated by changing other factors that affect human welfare, as well as by changing the demographic situation.

Proposals for dealing with population problems confront an intellectual and ideological minefield. While plausible, well-intentioned suggestions for mitigating population problems abound, no one knows exactly what will work across the whole range of population problems, or will work most efficiently in a given situation. Since generally accepted conclusions about what works in which circumstances are scarce, almost all proposed actions are motivated by some explicit or implicit ideology.

Suggestions for ameliorating population problems fall into three main groups: those intended to amplify human productive capacities, given the number and expectations of people to be served (the "bigger pie" school); those intended to reduce the number and expectations of people to be served, given human abilities to find well-being (the "fewer forks" school); and those intended to change the terms under which people interact, whatever the technology or population (the "better manners"

school). The enthusiasts of one school often neglect and suspect suggestions from the others.

The "bigger pie" school calls for new industrial, agricultural and civil technology of all types for both developed and developing countries. One enthusiast of technology, Jesse H. Ausubel, of the Program for the Human Environment at Rockefeller University, wrote: "The only way to meet the challenge of the multiplication of needs is to substantially enhance the contributions of science and technology to development and to enhance the cooperation between the science-rich and the science-poor."[4]

The "fewer forks" school calls for family-planning programs, for more effective and more acceptable contraceptives and sometimes for vegetarian diets (to reduce demand for animal feeds). Some proponents of the "fewer forks" school view technology as responsible for many adverse human impacts on the environment. Some argue, at the opposite extreme from Ausubel, that "the only way" to save the natural systems that support human life is to decrease human population growth rates, human numbers or human levels of consumption.

The "better manners" school calls for freer markets[5] or socialism (depending on taste), the breakup of large countries or the institution of world government or new forms of shared governance for sovereign states (depending on taste), democratic institutions, improved public policies, less corruption and the full life-cycle costing of business products. If poverty is the problem, the "better manners" school would propose to help poor people obtain increased access to credit, land, public infrastructure, education and health. In this approach, "a family planning program that emphasizes health services to the poor may be more easily justified on the grounds that it directly redistributes health resources to the poor than on the grounds that lower fertility may decrease poverty."[6]

How to Slow Human Population Growth

I focus here on large-scale efforts to slow or reverse human population growth because such efforts are less mature, more recent and less rewarded by existing economic institutions and incentives than are technological innovations. In my review of population history, I summarized six principal approaches to slowing population growth. In slogans, these approaches are promoting contraceptives; developing economies; saving children; empowering women; educating men; and doing everything at once. The Oxford economist Robert Cassen rightly emphasized that "virtually everything that needs doing from a population point of view needs doing anyway."[7]

Here I give a few examples of the people and institutions who have adopted one or more of these approaches. My sketches are drawn from political figures; private research institutions like the Population Council in New York; scientists; international organizations like the United Nations Fund for Population Activities; and nongovernmental advocacy groups.

A Politician

Shortly before his election to the vice-presidency of the United States, Albert Gore offered five "strategic goals [to] direct and inform our efforts to save the global environment."[8] His five goals were, first, to stabilize world population "with policies designed to create in every nation of the world the conditions necessary for the so-called demographic transition"; second, to create and develop "environmentally appropriate technologies—especially in the fields of energy, transportation, agriculture, building construction, and manufacturing --- capable of accommodating sustainable economic progress without the concurrent degradation of the environment"; third, to change economic ways of measuring human effects on the environment to "a system of economic accounting that assigns appropriate values to the ecological consequences of both routine choices in the marketplace by individuals and companies and larger, macroeconomic choices by nations"; fourth, to negotiate and approve new international agreements required to carry out the overall plan; and fifth, to establish "a cooperative plan for educating the world's citizens about our global environment."

To accelerate or induce a global demographic transition, Gore proposed three major approaches.[9] First, programs should be funded to assure "functional literacy [in] every society where the demographic transition has yet to occur. Although the emphasis should be on women, the programs should be directed to men as well. Coupled with this program should be a plan for basic education, emphasizing simple techniques in sustainable agriculture, specific lessons on preventing soil erosion, planting trees, and safeguarding clean water supplies." Second, programs should be developed "to reduce infant mortality and ensure the survival and excellent health of children." Third, programs should "[e]nsure that birth control devices and techniques are made ubiquitously available along

with culturally appropriate instruction. At the same time, scientists must be charged with stepping up research into improved and more easily accepted contracepti[ve] techniques. Depending upon the culture, delayed marriages and birth spacing should also be emphasized, along with traditional practices such as breast feeding (which simultaneously improves the health of children and suppresses fertility)." Contraception, Gore emphasized, is a preferable alternative to abortion; and the Roman Catholic Church, as an advocate of education and lowered infant mortality, should be enlisted as an ally in efforts to achieve a demographic transition.

A Private Research Institute

The Population Council in New York is one of the world's leading private, nonprofit population institutes, and one of the few to carry out research in both the biomedical and the social sciences related to population. It created the long-acting implantable contraceptive called Norplant and carried out long-term evaluations of the effectiveness of family-planning programs.[10] It shapes and reflects the view of many demographers and national and international officials responsible for population-related policies.

John Bongaarts, a vice-president in charge of research at the Population Council and a leading demographic researcher, analyzed quantitatively three factors responsible for the anticipated rise in the population of the developing countries.[11] His analysis started from a World Bank projection that the developing countries would grow from 4.5 billion people in 1995 to 10.2 billion in 2100, an increase of 5.7 billion. Bongaarts attributed to population momentum an increase of 2.8 billion; to unwanted fertility an increase of 1.9 billion; and to high desired family size an increase of 1 billion. He proposed programs to counteract each of these factors.

The biggest source of population growth, population momentum, responsible for nearly half the anticipated increase, results from the very high fraction of young people in developing countries, including young people of an age to bear children and those still too young to bear children. Today's high fraction of young people in developing countries is a legacy of the failures of both developed and developing countries over the past few decades to create the conditions for a rapid fall in fertility. One way to counteract population momentum is to induce women to have far fewer than an average of two children each, as in the one-child policy of China. Bongaarts considered this possibility briefly and discarded it. Instead, he recommended trying to raise the average age of women at childbearing in developing countries. His simulations suggested that if all women, now and henceforth, delayed having children by five years compared to the present ages at which they bear children, the rise due to population momentum could be reduced from 2.8 billion to 1.6 billion, assuming that fertility were just at replacement level.

Policy options to raise the age of childbearing include raising the legal age of marriage and prolonging the education of girls, especially in secondary schools. In a sample of women who had ever been married and who were aged 30 to 34 years at the time of the study in 23 developing countries, the median age of the mother when she had her first birth was 22.8 years among women with secondary education, while that of women with no education was 19.3 years. These data suggest that achieving a five-year delay in childbearing (as assumed in Bongaarts's simulations above) could require a greater social change than assuring all women a secondary education.

Bongaarts also recommended making contraceptive information and services available to adolescents. Adolescents often use contraception sporadically or not at all when they become sexually active, and consequently begin to bear children much earlier than they would if they had better information and services. Bongaarts understated the difficulty of implementing this suggestion when he remarked: "Governments have been reluctant to address these problems of adolescents for social and political reasons."[12]

The second largest source of increased population (an additional 1.9 billion) in developing countries over the next century was unwanted fertility, in Bongaarts's analysis. Bongaarts estimated that, in the developing countries outside China, about 100 million women—one married woman in six—has an unmet demand for contraception and about one birth in four is unwanted; further, a large fraction of the approximately 25 million abortions annually are conducted illegally or unsafely, or both. "Many of these undesirable pregnancies can be prevented if women are given greater control over their sexual and reproductive lives."[13] Family-planning programs would provide women and men with the information and means to decrease the number of mistimed and unwanted pregnancies. Such programs would also be likely to improve the health of women and children, in part by putting them in regular contact with providers of medical services.

The source of an additional billion people in developing countries by 2100 was the desire for large families, according to Bongaarts. Surveys in the late 1980s in 27 countries in Africa, Asia and Latin America found that desired family sizes everywhere exceeded two children; in sub-Saharan Africa, people wanted nearly six children. Bongaarts proposed to lessen the desire for large families by "investments in human development"[14] so that parents would value smaller families and invest more in the children they have. Governments could aim for improvements in levels of education, the status of women and the survival of children.

Educational opportunities for children diminish the immediate value of children as workers and make them more expensive because the children require books, uniforms and school fees. According to Bongaarts,

> Of all the social and economic factors that have been studied for their potential effect on reproductive behavior, the level of education stands out as the most consistent. This relation is attributable to shifts in the costs and benefits of children but also, and perhaps more importantly, to an acceleration in cultural change and the adoption of new, mostly western values that are facilitated by the introduction of mass schooling.[15]

Improving the legal, social and economic status of women also raises the cost of children by giving women potential roles other than motherhood and encouraging women to act independently and innovatively in contraception. "Empowering women is also likely to lead to reductions in the dominance of husbands (or other household members) over women, the societal preference for male offspring, and the value of . . . children as insurance against adversity (for example, in old age) and as securers of women's positions in families."[16]

Public health programs to reduce death rates among infants and children would reduce the fatalism of parents, encourage investments in the health and education of children and increase the likelihood that the desired number of children will survive to adulthood. Bongaarts asserted that "no population in the developing world has experienced a sustained fertility reduction without first having gone through a major decline in infant and child mortality."[17]

Other tactics to encourage parents to have fewer children include monetary incentives for contraception and disincentives for large families, and messages in mass media about styles of life incompatible with large families.

In preparation for the 1994 International Conference on Population and Development in Cairo, the Population Council set out an agenda of action and research for the coming decades. In a pamphlet entitled *Population Growth and Our Caring Capacity*, the Population Council took a broad view of the effects of rapid population growth on global resources, on the capacity of national and local institutions to supply the services and protections of civil society and on the welfare of families and individuals.

> Reducing the numbers of human beings should not be a goal in itself, but rather a means toward achieving improved human welfare through a more sustainable balance of population and resources, a reduction of disparities in life opportunities, and a realignment of the risks and benefits of reproduction. The fundamental question behind concerns about population growth must be not only "Will there be sufficient resources?," but also "How will they be distributed?"
>
> If rapid population growth is understood to be of interest because of the ways it diminishes the present and future quality of human life and environmental integrity, then we must seek a broader spectrum of solutions than the international and national communities typically have promoted.[18] ....
>
> It is time to advocate—without ambiguity or timidity—positive social investments that are good in themselves and have a demonstrable fertility-reduction impact.... In short, one can promote a smaller world by promoting a just world.[19]

The Population Council's pamphlet proposed loosening governments' widespread identification between demographic goals and family-planning programs in two respects. First, governments should try to achieve their demographic goals through all the social and economic programs available to them, not just through family-planning programs. Second, family-planning programs should be viewed not merely as instruments for achieving demographic goals, but as "key social investments" to help people reproduce voluntarily and healthily, when and to the extent that they choose.

Academies of Science

In October 1993, representatives of 58 scientific academies signed a brief report called *Population Summit of the World's Scientific Academies*.[20] The report reviewed the United Nations' long-term population projections; essayed to identify the key determinants of population growth; sketched relations among human population size, economic development and the natural environment; and made recommendations for action.

The report urged that "all reproductive health services must be implemented as a part of broader strategies to raise the quality of human life." These strategies include reducing and eliminating inequalities between men and women in sexual, social and economic life; convenient reproductive health services (including family planning), regardless of ability to pay; "elimination of unsafe and coercive practices" in family planning (a two-edged reference, presumably, to reportedly forced abortions in China and backroom abortions in countries where abortion is illegal); and more attention to clean water, sanitation, primary health care, education and power for the poor and for women.

The report reserved its most specific, detailed and ambitious suggestions for scientists, engineers and health professionals. It urged them to study and offer advice on an enormous range of topics, including "cultural, social, economic, religious, educational, and political factors that affect reproductive behavior, family size, and successful family planning; . . . economic inefficiencies; social inequalities; and ethnic, class or gender biases; global and local environmental change . . . , its causes (including the roles of poverty, population growth, economic growth, technology, national and international politics), and policies to mitigate its effects"; education, especially of women; improved family-planning programs, maternal and child health care and primary health care generally; transitions to economies that consume less energy and materials; increasing the capacity of developing countries in the natural sciences, engineering, medicine, the social sciences and management; "technologies and strategies for sustainable development (agriculture, energy, resource use, pollution control, materials recycling, environmental management and protection); networks, treaties, and conventions that protect the global commons; strengthened world-wide exchanges of scientists in education, training, and research."

Among the signers of this report were representatives of six African national academies, including those of Ghana, Kenya, Nigeria and Uganda from sub-Saharan Africa. However, the African Academy of Sciences, one of the 15 academies that convened the summit meeting, did not sign the main report but issued its own statement instead.[21] Acknowledging that rapid population growth rates may be a problem for some countries, the dissent argued that "for Africa, population remains an important resource for development, without which the continent's natural resources will remain latent and unexplored. Human resource development must therefore form part of the population / resource issue." Because population problems vary widely among countries and regions, not all countries can share the same population goals. ". . . for certain parts of Africa, infertility is a major problem. . . . In Africa, many of the so-called impediments to family planning have a rationality which require[s] careful assessment." As for natural limits on population, the African dissent stated: "Whether or not the earth is finite will depend on the extent to which science and technology [are] able to transform the resources available for humanity. There is only one earth—yes; but the potential for transforming it is not necessarily finite."

An Agency of the United Nations

The United Nations Fund for Population Activities (UNFPA) is foremost, though not alone, among the U.N. agencies that attempt to affect population growth. Other agencies with related responsibilities include the World Health Organization (with responsibilities for reproductive health and sexually transmitted diseases), the Food and Agricultural Organization, the U. N. Development Program, the U. N. Environmental Program, the U. N. Children's Fund (UNICEF) and the U. N. Educational, Scientific and Cultural Organization (which has sponsored studies of the Earth's human carrying capacity).

The UNFPA's 1993 *Population Issues: Briefing Kit* highlighted the agency's major concerns in ten chapters of two pages each.[22] These concerns were rapid population growth; the special burdens of developing countries ("Continued rapid growth in developing countries has brought human numbers into collision with the resources to sustain them"); more adequate financing for population programs; family planning as a human right; comprehensive national population policies embracing family planning, demographic research, data collection, the wants of children and the elderly, urbanization, migration, education and communication; "gender equality: a country's best investment," to be achieved through equal educational opportunities for girls and boys, men and women; the degradation of air, land, water and biota "from ever-increasing numbers of people, ever-increasing demands for resources and ever-increasing pollution"; urbanization and migration; information, education and communication adapted to local cultures; and population data.

The UNFPA estimated that the world spent about $4.5 billion per year on population programs

in the early 1990s, a bit less than one United States dollar per person per year. Developing countries spent about $3.5 billion of their own resources and received about $958 million as population assistance. In 1991, only 1.3 percent of total official development assistance went for population programs, and more than one-third of that ($352 million) came from the United States. Funding for the UNFPA was constant in real terms for the few years before the 1993 report. Not surprisingly, the UNFPA called for doubled funding for population programs by the year 2000.

A Private Foundation

In addition to governments, several private foundations support population programs. Though most private foundations cannot supply as much money as some governments, they are freer to do experiments that demonstrate what works or does not work. In 1992 the population program of the John D. and Catherine T. MacArthur Foundation in Chicago, Illinois, spent $12.1 million on population programs: $6.1 million for women's reproductive health, $0.6 million for population and natural resources, $2.3 million for communications and popular education, $1.1 million to develop individual leaders in population programs in developing countries and $2.0 million for other initiatives. The program emphasized activities in Mexico, Brazil, Nigeria and India.

Overview

This small sample shows that diverse approaches are being advocated, and in some cases funded, to slow population growth. "The issue now is where to put the marginal population-control dollar,"[23] wrote journalist Peter Passell during the wrangling at the United Nations in April 1994 in preparation for the International Conference on Population and Development. A major issue is whether to focus on increasing the supply and lowering the cost of contraception, or to focus on increasing the demand for reduced fertility, for example through economic development, improvements in the status of women and mass communications.[24]

Unfortunately, there appears to be no believable information to show that a dollar spent to put girls through primary school will lower the total fertility rate more, now or a decade from now, than a dollar spent on radio programs about small families or a dollar spent on health clinics for mothers and children or a dollar spent to distribute contraceptives.[25] The experiences (described earlier) of Indonesia, which had a very rapid fall in fertility from 1970 to 1985, and Kenya, where fertility began to fall in the last half of the 1980s, suggested that well-developed family-planning programs interacted with educational, cultural and economic changes to lower fertility by more than the sum of their separate effects.

Asking whether family-planning programs or desires for children are the primary determinants of fertility resembles asking whether airline passengers fly because airplanes exist or because passengers want to go somewhere. Aristotle, who distinguished efficient causes from final causes (or means from goals) more than two millennia ago, would have been amused. People can travel without airplanes, but the great convenience of airplanes promotes travel. People can reduce their fertility without family-planning programs, but the great convenience (relative to the alternatives) of modern contraception facilitates lowered fertility.

Questions

An end to long-term average population growth is inevitable, very probably within the twenty-first century. Questions under debate are: just how soon and by what means and at whose expense? Here are eight issues that remain to be resolved.

1. How will the bill for family planning and other population activities be distributed between the developing countries (who now pay perhaps 80 percent) and the rich countries?
2. Who will spend the money, and how? How will the available monies be allocated between governments and nongovernmental organizations? How much will go for family planning and how much for allied programs like reproductive health?
3. How will environmental goals be balanced against economic goals? For example, if reducing poverty requires increased industrial and agricultural production in developing countries, can the increases in production be achieved at acceptable environmental costs?
4. How will cultural change be balanced against cultural continuity? In some cultural settings, the goal of empowering women directly contradicts the goal of maintaining "full respect for the various religious and ethical values and cultural backgrounds." Both goals were often repeated in the final document of the 1994 International Conference on Population and Development. Women achieved the vote in the United States only in 1920 and only after considerable struggle. Asking for equality for

women now asks some cultures to make far greater change in far less time. I fully support such demands, but they should be made with a clear and sympathetic understanding that they require profound cultural change.

5. How will the often-asserted right of couples and individuals to control their fertility be reconciled with national demographic goals if the way couples and individuals exercise that right happens not to bring about the demographic goals?

6. How will national sovereignty be reconciled with world or regional environmental and demographic goals? This question arises in the control of rqigration, reproduction and all economic activities that involve the global commons of atmosphere, oceans and international water bodies, and the management of the plant and animal populations that inhabit them.

7. How will the desire and moral obligation to alleviate poverty and suffering as rapidly as possible be reconciled with the use of local scarcities as an efficient market signal?

8. In efforts to protect the physical, chemical and biological environments provided by this finite sphere, how will rapid population growth and economic development in poor countries be balanced against high consumption per person in the rich countries?

Notes

1. Dorn 1962, in Cox 1969, p. 275.
2. According to the Honorable Danny J. Boggs (personal communication, 28 December 1994), this phrase appears in 71 United States federal cases; the variant form "Justice deferred is justice denied" occurs in one.
3. Victor Fuchs, in Singer 1971.
4. Ausubel 1993, p. 17.
5. E.g., Carlson and Bernstam 1991.
6. Dennis A. Ahlburg in Cassen et al. 1994, p. 35.
7. Cassen et al. 1994, p. 23.
8. Gore 1992, pp. 305-7.
9. lbid., pp. 313-14.
10. E.g., Mauldin and Ross 1991.
11. Bongaarts 1994, p. 774.
12. lbid., p. 775.
13. lbid., p. 773. The United Nations Fund for Population Activities 1993b, p. 1, estimated that at least 120 million couples worldwide want to limit the number of their children or space childbearing, but lack access to adequate family-planning services. Bongaarts's estimate of 100 million women with unmet demand for family planning applied only to developing countries outside of China.
14. Bongaarts 1994, p. 774.
15. Ibid., p. 774.
16. Ibid., p. 774.
17. Ibid., p. 774.
18. Population Council 1994, p. 2.
19. Ibid., pp. 7-13.
20. Science Summit 1994.
21. African Academy of Sciences 1994.
22. United Nations Fund for Population Activities 1993a.
23. Passell 1994.
24. Westoff 1994; Chesler 1994.
25. Pritchett 1994, p. 3.

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Living on a Lifeboat

Garrett Hardin

Susanne Langer (1942) has shown that it is probably impossible to approach an unsolved problem save through the door of metaphor. Later, attempting to meet the demands of rigor, we may achieve some success in cleansing theory of metaphor, though our success is limited if we are unable to avoid using common language, which is shot through and through with fossil metaphors. (I count no fewer than five in the preceding two sentences.)

Since metaphorical thinking is inescapable it is pointless merely to weep about our human limitations. We must learn to live with them, to understand them, and to control them. "All of us," said George Eliot in *Middlemarch*, "get our thoughts entangled in metaphors, and act fatally on the strength of them." To avoid unconscious suicide we are well advised to pit one metaphor against another. From the interplay of competitive metaphors, thoroughly developed, we may come closer to metaphor-free solutions to our problems.

No generation has viewed the problem of the survival of the human species as seriously as we have. Inevitably, we have entered this world of concern through the door of metaphor. Environmentalists have emphasized the image of the earth as a spaceship—Spaceship Earth. Kenneth Boulding (1966) is the principal architect of this metaphor. It is time, he says, that we replace the wasteful "cowboy economy" of the past with the frugal "spaceship economy" required for continued survival in the limited world we now see ours to be. The metaphor is notably useful in justifying pollution control measures.

Unfortunately, the image of a spaceship is also used to promote measures that are suicidal. One of these is a generous immigration policy, which is only a particular instance of a class of policies that are in error because they lead to the tragedy of the commons (Hardin 1968). These suicidal policies are attractive because they mesh with what we unthinkably take to be the ideals of "the best people." What is missing in the idealistic view is an insistence that rights and responsibilities must go together. The "generous" attitude of all too many people results in asserting inalienable rights while ignoring or denying matching responsibilities.

For the metaphor of a spaceship to be correct the aggregate of people on board would have to be under unitary sovereign control (Ophuls 1974). A true ship always has a captain. It is conceivable that

a ship could be run by a committee. But it could not possibly survive if its course were determined by bickering tribes that claimed rights without responsibilities.

What about Spaceship Earth? It certainly has no captain, and no executive committee. The United Nations is a toothless tiger, because the signatories of its charter wanted it that way. The spaceship metaphor is used only to justify spaceship demands on common resources without acknowledging corresponding spaceship responsibilities.

An understandable fear of decisive action leads people to embrace "incrementalism"—moving toward reform by tiny stages. As we shall see, this strategy is counterproductive in the area discussed here if it means accepting rights before responsibilities. Where human survival is at stake, the acceptance of responsibilities is a precondition to the acceptance of rights, if the two cannot be introduced simultaneously.

Lifeboat Ethics

Before taking up certain substantive issues let us look at an alternative metaphor, that of a lifeboat. In developing some relevant examples the following numerical values are assumed. Approximately two-thirds of the world is desperately poor, and only one-third is comparatively rich. The people in poor countries have an average per capita GNP (Gross National Product) of about $200 per year; the rich, of about $3,000. (For the United States it is nearly $5,000 per year.) Metaphorically, each rich nation amounts to a lifeboat full of comparatively rich people. The poor of the world are in other, much more crowded lifeboats. Continuously, so to speak, the poor fall out of their lifeboats and swim for a while in the water outside, hoping to be admitted to a rich lifeboat, or in some other way to benefit from the "goodies" on board. What should the passengers on a rich lifeboat do? This is the central problem of "the ethics of a lifeboat."

First we must acknowledge that each lifeboat is effectively limited in capacity. The land of every nation has a limited carrying capacity. The exact limit is a matter for argument, but the energy crunch is convincing more people every day that we have already exceeded the carrying capacity of the land. We have been living on "capital"—stored petroleum and coal—and soon we must live on income alone.

Let us look at only one lifeboat—ours. The ethical problem is the same for all, and is as follows. Here we sit, say 50 people in a lifeboat. To be generous, let us assume our boat has a capacity of 10 more, making 60. (This, however, is to violate the engineering principle of the "safety factor." A new plant disease or a bad change in the weather may decimate our population if we don't preserve some excess capacity as a safety factor.)

The 50 of us in the lifeboat see 100 others swimming in the water outside, asking for admission to the boat, or for handouts. How shall we respond to their calls? There are several possibilities.

One. We may be tempted to try to live by the Christian ideal of being "our brother's keeper," or by the Marxian ideal (Marx 1875) of "from each according to his abilities, to each according to his needs." Since the needs of all are the same, we take all the needy into our boat, making a total of 150 in a boat with a capacity of 60. The boat is swamped, and everyone drowns. Complete justice, complete catastrophe.

Two. Since the boat has an unused excess capacity of 10, we admit just 10 more to it. This has the disadvantage of getting rid of the safety factor, for which action we will sooner or later pay dearly. Moreover, *which* 10 do we let in? "First come, first served?" The best 10? The neediest 10? How do we *discriminate*? And what do we say to the 90 who are excluded?

Three. Admit no more to the boat and preserve the small safety factor. Survival of the people in the lifeboat is then possible (though we shall have to be on our guard against boarding parties).

The last solution is abhorrent to many people. It is unjust, they say. Let us grant that it is.

"I feet guilty about my good luck," say some. The reply to this is simple: *Get out and yield your place to others*. Such a selfless action might satisfy the conscience of those who are addicted to guilt but it would not change the ethics of the lifeboat. The needy person to whom a guilt-addict yields his place will not himself feel guilty about his sudden good luck. (If he did he would not climb aboard.) The net result of conscience-stricken people relinquishing their unjustly held positions is the elimination of their kind of conscience from the lifeboat. The lifeboat, as it were, purifies itself of guilt. The ethics of the lifeboat persist, unchanged by such momentary aberrations.

This then is the basic metaphor within which we must work out our solutions. Let us enrich the image step by step with substantive additions from the real world.

Reproduction

The harsh characteristics of lifeboat ethics are heightened by reproduction, particularly by reproductive differences. The people inside the lifeboats of the wealthy nations are doubling in numbers every 87 years; those outside are doubling every 35 years, on the average. And the relative difference in prosperity is becoming greater.

Let us, for a while, think primarily of the U.S. lifeboat. As of 1973 the United States had a population of 210 million people, who were increasing by 0.8% per year, that is, doubling in number every 87 years.

Although the citizens of rich nations are outnumbered two to one by the poor, let us imagine an equal number of poor people outside our lifeboat—a mere 210 million poor people reproducing at a quite different rate. If we imagine these to be the combined populations of Colombia, Venezuela, Ecuador, Morocco, Thailand, Pakistan, and the Philippines, the average rate of increase of the people "outside" is 3.3% per year. The doubling time of this population is 21 years.

Suppose that all these countries, and the United States, agreed to live by the Marxian ideal, "to each according to his needs," the ideal of most Christians as well. Needs, of course, are determined by population size, which is affected by reproduction. Every nation regards its rate of reproduction as a sovereign right. If our lifeboat were big enough in the beginning it might be possible to live *for a while* by Christian-Marxian ideals. *Might.*

Initially, in the model given, the ratio of non-Americans to Americans would be one to one. But consider what the ratio would be 87 years later. By this time Americans would have doubled to a population of 420 million. The other group (doubling every 21 years) would now have swollen to 3,540 million. Each American would have more than eight people to share with. How could the lifeboat possibly keep afloat?

All this involves extrapolation of current trends into the future, and is consequently suspect. Trends may change. Granted: but the change will not necessarily be favorable. If—as seems likely—the rate of population increase falls faster in the ethnic group presently inside the lifeboat than it does among those now outside, the future will turn out to be even worse than mathematics predicts, and sharing will be even more suicidal.

Ruin in the Commons

The fundamental error of the sharing ethic is that it leads to the tragedy of the commons. Under a system of private property the man (or group of men) who own property recognize their responsibility to care for it, for if they don't they will eventually suffer. A farmer, for instance, if he is intelligent, will allow no more cattle in a pasture than its carrying capacity justifies. If he overloads the pasture, weeds take over, erosion sets in, and the owner loses in the long run.

But if a pasture is run as a commons open to all, the right of each to use it is not matched by an operational responsibility to take care of it. It is no use asking independent herdsmen in a commons to act responsibly, for they dare not. The considerate herdsman who refrains from overloading the commons suffers more than a selfish one who says his needs are greater. (As Leo Durocher says, "Nice guys finish last.") Christian-Marxian idealism is counterproductive. That it *sounds* nice is no excuse. With distribution systems, as with individual morality, good intentions are no substitute for good performance.

A social system is stable only if it is insensitive to errors. To the Christian-Marxian idealist a selfish person is a sort of "error." Prosperity in the system of the commons cannot survive errors. If *everyone* would only restrain himself, all would be well; but it takes *only one less than everyone* to ruin a system of voluntary restraint. In a crowded world of less than perfect human beings—and we will never know any other—mutual ruin is inevitable in the commons. This is the core of the tragedy of the commons.

One of the major tasks of education today is to create such an awareness of the dangers of the commons that people will be able to recognize its many varieties, however disguised. There is pollution of the air and water because these media are treated as commons. Further growth of population and growth in the per capita conversion of natural resources into pollutants require that the system of the commons be modified or abandoned in the disposal of "externalities."

The fish populations of the oceans are exploited as commons, and ruin lies ahead. No technological invention can prevent this fate: in fact, all improvements in the art of fishing merely hasten the day of complete ruin. Only the replacement of the system of the commons with a responsible system can save oceanic fisheries.

The management of western range lands, though nominally rational, is in fact (under the steady pressure of cattle ranchers) often merely a government-sanctioned system of the commons, drifting toward ultimate ruin for both the range lands and the residual enterprisers.

World Food Banks

In the international arena we have recently heard a proposal to create a new commons, namely an international depository of food reserves to which nations will contribute according to their abilities, and from which nations may draw according to their needs. Nobel laureate Norman Borlaug has lent the prestige of his name to this proposal.

A world food bank appeals powerfully to our humanitarian impulses. We remember John Donne's celebrated line, "Any man's death diminishes me." But before we rush out to see for whom the bell tolls let us recognize where the greatest political push for international granaries comes from, lest we be disillusioned later. Our experience with Public Law 480 clearly reveals the answer. This was the law that moved billions of dollars worth of U.S. grain to food-short, population-long countries during the past two decades. When P.L. 480 first came into being, a headline in the business magazine *Forbes* (Paddock and Paddock 1970) revealed the power behind it: "Feeding the World's Hungry Millions: How it will mean billions for U.S. business."

And indeed it did. In the years 1960 to 1970 a total of $7.9 billion was spent on the "Food for Peace" program, as P.L. 480 was called. During the years 1948 to 1970 an additional $49.9 billion were extracted from American taxpayers to pay for other economic aid programs, some of which went for food and food-producing machinery. (This figure does *not* include military aid.) That P.L. 480 was a give-away program was concealed. Recipient countries went through the motions of paying for P.L. 480 food—with IOU's. In December 1973 the charade was brought to an end as far as India was concerned when the United States "forgave" India's $3.2 billion debt (Anonymous 1974). Public announcement of the cancellation of the debt was delayed for two months: one wonders why.

"Famine—1974!" (Paddock and Paddock 1970) is one of the few publications that points out the commercial roots of this humanitarian attempt. Though all U.S. taxpayers lost by P.L. 480, special interest groups gained handsomely. Farmers benefited because they were not asked to contribute the grain—it was bought from them by the taxpayers. Besides the direct benefit there was the indirect effect of increasing demand and thus raising prices of farm products generally. The manufacturers of farm machinery, fertilizers, and pesticides benefited by the farmers' extra efforts to grow more food. Grain elevators profited from storing the grain for varying lengths of time. Railroads made money hauling it to port, and shipping lines by carrying it overseas. Moreover, once the machinery for P.L. 480 was established an immense bureaucracy had a vested interest in its continuance regardless of its merits.

Very little was ever heard of these selfish interests when P.L. 480 was defended in public. The emphasis was always on its humanitarian effects. The combination of multiple and relatively silent selfish interests with highly vocal humanitarian apologists constitutes a powerful lobby for extracting money from taxpayers. Foreign aid has become a habit that can apparently survive in the absence of any known justification. A news commentator in a weekly magazine (Lansner 1974), after exhaustively going over all the conventional arguments for foreign aid—self-interest, social justice, political advantage, and charity—and concluding that none of the known arguments really held water, concluded: "So the search continues for some logically compelling reasons for giving aid . . ." In other words, *Act now, Justify later*—if ever. (Apparently a quarter of a century is too short a time to find the justification for expending several billion dollars yearly.)

The search for a rational justification can be short-circuited by interjecting the word "emergency." Borlaug uses this word. We need to look sharply at it. What is an "emergency?" It is surely something like an accident, which is correctly defined *as an event that is certain to happen, though with a low frequency* (Hardin 1972a). A well-run organization prepares for everything that is certain, including accidents and emergencies. It budgets for them. It saves for them. It expects them—and mature decision-makers do not waste time complaining about accidents when they occur.

What happens if some organizations budget for emergencies and others do not? If each organization is solely responsible for its own well-being, poorly managed ones will suffer. But they should be able to learn from experience. They have a chance to mend their ways and learn to budget for infrequent but certain emergencies. The weather, for instance, always varies and periodic crop failures are certain. A wise and competent government saves out of the production of the good years in anticipation of

bad years that are sure to come. This is not a new idea. The Bible tells us that Joseph taught this policy to Pharaoh in Egypt more than 2,000 years ago. Yet it is literally true that the vast majority of the governments of the world today have no such policy. They lack either the wisdom or the competence, or both. Far more difficult than the transfer of wealth from one country to another is the transfer of wisdom between sovereign powers or between generations.

"But it isn't their fault! How can we blame the poor people who are caught in an emergency? Why must we punish them?" The concepts of blame and punishment are irrelevant. The question is, what are the operational consequences of establishing a world food bank? If it is open to every country every time a need develops, slovenly rulers will not be motivated to take Joseph's advice. Why should they? Others will bail them out whenever they are in trouble.

Some countries will make deposits in the world food bank and others will withdraw from it: there will be almost no overlap. Calling such a depository-transfer unit a "bank" is stretching the metaphor of *bank* beyond its elastic limits. The proposers, of course, never call attention to the metaphorical nature of the word they use.

The Ratchet Effect

An "international food bank" is really, then, not a true bank but a disguised one-way transfer device for moving wealth from rich countries to poor. In the absence of such a bank, in a world inhabited by individually responsible sovereign nations, the population of each nation would repeatedly go through a cycle of the sort shown in Figure 1. P_2 is greater than P_1, either in absolute numbers or because a deterioration of the food supply has removed the safety factor and produced a dangerously low ratio of resources to population. P_2 may be said to represent a state of overpopulation, which becomes obvious upon the appearance of an "accident," e.g., a crop failure. If the "emergency" is not met by outside help, the population drops back to the "normal" level—the "carrying capacity" of the environment—or even below. In the absence of population control by a sovereign, sooner or later the population grows to P_2 again and the cycle repeats. The long-term population curve (Hardin 1966) is an irregularly fluctuating one, equilibrating more or less about the carrying capacity.

A demographic cycle of this sort obviously involves great suffering in the restrictive phase, but such a cycle is normal to any independent country with inadequate population control. The third century theologian Tertullian (Hardin 1969a) expressed what must have been the recognition of many wise men when he wrote: "The scourges of pestilence, famine, wars, and earthquakes have come to be regarded as a blessing to overcrowded nations, since they serve to prune away the luxuriant growth of the human race."

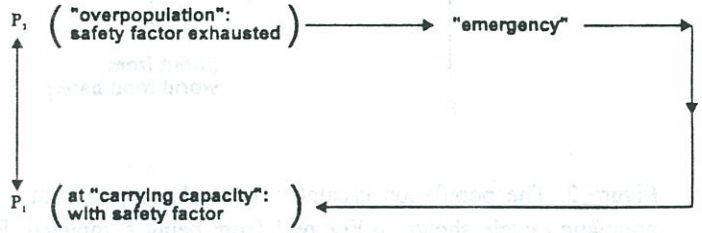

Figure 1. The population cycle of a nation that has no effective, conscious population control, and which receives no aid from the outside. P_2 is greater than P_1.

Only under a strong and farsighted sovereign—which theoretically could be the people themselves, democratically organized—can a population equilibrate at some set point below the carrying capacity, thus avoiding the pains normally caused by periodic and unavoidable disasters. For this happy state to be achieved it is necessary that those in power be able to contemplate with equanimity the "waste" of surplus food in times of bountiful harvests. It is essential that those in power resist the temptation to convert extra food into extra babies. On the public relations level it is necessary that the phrase "surplus food" be replaced by "safety factor."

But wise sovereigns seem not to exist in the poor world today. The most anguishing problems are created by poor countries that are governed by rulers insufficiently wise and powerful. If such countries can draw on a world food bank in times of "emergency," the population *cycle* of Figure 1 will be replaced by the population *escalator* of Figure 2. The input of food from a food bank acts as the pawl of a ratchet, preventing the population from retracing its steps to a lower level. Reproduction pushes the population upward, inputs from the world bank prevent its moving downward. Population size escalates, as does the absolute magnitude of "accidents" and "emergencies." The process is brought to an end only by the total collapse of the

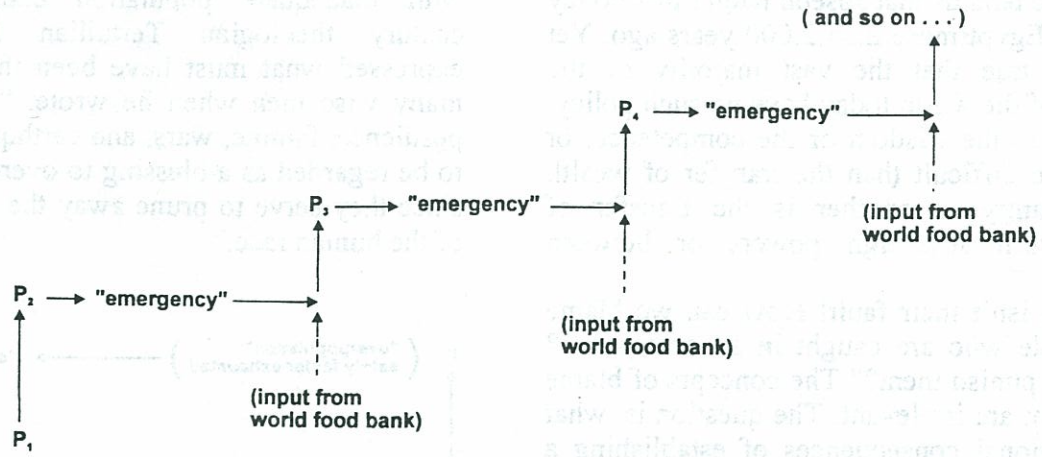

Figure 2. The population escalator. Note that input from a world food bank acts like the pawl of a ratchet, preventing the normal population cycle shown in Figure 1 from being completed. Pn+1 is greater than Pn, and the absolute magnitude of the "emergencies" escalates. Ultimately the entire system crashes. The crash is not shown, and few can imagine it.

whole system, producing a catastrophe of scarcely imaginable proportions.

Such are the implications of the well-meant sharing of food in a world of irresponsible reproduction.

I think we need a new word for systems like this. The adjective "melioristic" is applied to systems that produce continual improvement; the English word is derived from the Latin *meliorare*, to become or make better. Parallel with this it would be useful to bring in the word *pejoristic* (from the Latin *pejorare*, to become or make worse). This word can be applied to those systems which, by their very nature, can be relied upon to make matters worse. A world food bank coupled with sovereign state irresponsibility in reproduction is an example of a pejoristic system.

This pejoristic system creates an unacknowledged commons. People have more motivation to draw from than to add to the common store. The license to make such withdrawals diminishes whatever motivation poor countries might otherwise have to control their populations. Under the guidance of this ratchet, wealth can be steadily moved in one direction only, from the slowly-breeding rich to the rapidly-breeding poor, the process finally coming to a halt only when all countries are equally and miserably poor.

All this is terribly obvious once we are acutely aware of the pervasiveness and danger of the commons. But many people still lack this awareness and the euphoria of the "benign demographic transition" (Hardin 1973) interferes with the realistic appraisal of pejoristic mechanisms. As concerns public policy, the deductions drawn from the benign demographic transition are these:

1)If the per capita GNP rises the birth rate will fall: hence, the rate of population increase will fall, ultimately producing ZPG (Zero Population Growth).

2)The long-term trend all over the world (including the poor countries) is of a rising per capita GNP (for which no limit is seen).

3)Therefore, all political interference in population matters is unnecessary; all we need to do is foster economic "development"—*note the metaphor*—and population problems will solve themselves.

Those who believe in the benign demographic transition dismiss the pejoristic mechanism of Figure 2 in the belief that each input of food from the world outside fosters development within a poor country thus resulting in a drop in the rate of population increase. Foreign aid has proceeded on this assumption for more than two decades. Unfortunately it has produced no indubitable instance of the asserted effect. It has, however, produced a library of excuses. The air is filled with plaintive calls for more massive foreign aid appropriations so that the hypothetical melioristic process can get started.

The doctrine of demographic laissez-faire implicit in the hypothesis of the benign demographic transition is immensely attractive. Unfortunately

there is more evidence against the melioristic system than there is for it (Davis 1963). On the historical side there are many counterexamples. The rise in per capita GNP in France and Ireland during the past century has been accompanied by a rise in population growth. In the 20 years following the Second World War the same positive correlation was noted almost everywhere in the world. Never in world history before 1950 did the worldwide population growth reach 1% per annum. Now the average population growth is over 2% and shows no signs of slackening.

On the theoretical side, the denial of the pejoristic scheme of Figure 2 probably springs from the hidden acceptance of the "cowboy economy" that Boulding castigated. Those who recognize the limitations of a spaceship, if they are unable to achieve population control at a safe and comfortable level, accept the necessity of the corrective feedback of the population cycle shown in Figure 1. No one who knew in his bones that he was living on a true spaceship would countenance political support of the population escalator shown in Figure 2.

Eco-Destruction Via the Green Revolution

The demoralizing effect of charity on the recipient has long been known. "Give a man a fish and he will eat for a day: teach him how to fish and he will eat for the rest of his days." So runs an ancient Chinese proverb. Acting on this advice the Rockefeller and Ford Foundations have financed a multipronged program for improving agriculture in the hungry nations. The result, known as the "Green Revolution," has been quite remarkable. "Miracle wheat" and "miracle rice" are splendid technological achievements in the realm of plant genetics.

Whether or not the Green Revolution can increase food production is doubtful (Harris 1972, Paddock 1970, Wilkes 1972), but in any event not particularly important. What is missing in this great and well-meaning humanitarian effort is a firm grasp of fundamentals. Considering the importance of the Rockefeller Foundation in this effort it is ironic that the late Alan Gregg, a much-respected-vice president of the Foundation, strongly expressed his doubts of the wisdom of all attempts to increase food production some two decades ago. (This was before Borlaug's work --supported by Rockefeller—had resulted in the development of "miracle wheat.") Gregg (1955) likened the growth and spreading of humanity over the surface of the earth to the metastasis of cancer in the human body, wryly remarking that "Cancerous growths demand food; but, as far as I know, they have never been cured by getting it."

"Man does not live by bread alone"—the scriptural statement has a rich meaning even in the material realm. Every human being born constitutes a draft on all aspects of the environment—food, air, water, unspoiled scenery, occasional and optional solitude, beaches, contact with wild animals, fishing, hunting—the list is long and incompletely known. Food can, perhaps, be significantly increased: but what about clean beaches, unspoiled forests, and solitude? If we satisfy the need for food in a growing population we necessarily decrease the supply of other goods, and thereby increase the difficulty of equitably allocating scarce goods (Hardin 1969b,1972b).

The present population of India is 600 million, and it is increasing by 15 million per year. The environmental load of this population is already great. The forests of India are only a small fraction of what they were three centuries ago. Soil erosion, floods, and the psychological costs of crowding are serious. Every one of the net 15 million lives added each year stresses the Indian environment more severely. *Every life saved this year in a poor country diminishes the quality of life for subsequent generations.*

Observant critics have shown how much harm we wealthy nations have already done to poor nations through our well-intentioned but misguided attempts to help them (Paddock and Paddock 1973). Particularly reprehensible is our failure to carry out postaudits of these attempts (Farvar and Milton 1972). Thus have we shielded our tender consciences from knowledge of the harm we have done. Must we Americans continue to fail to monitor the consequences of our external "do-gooding?" If, for instance, we thoughtlessly make it possible for the present 600 million Indians to swell to 1,200 millions by the year 2001—as their present growth rate promises—will posterity in India thank us for facilitating an even greater destruction of *their* environment? Are good intentions ever a sufficient excuse for bad consequences?

Immigration Creates a Commons

I come now to the final example of a commons in action, one for which the public is least prepared for rational discussion. The topic is at present enveloped by a great silence which reminds me of a comment made by Sherlock Holmes in A. Conan Doyle's story, "Silver Blaze." Inspector Gregory had asked, "Is there any point to which you

would wish to draw my attention?" To this Holmes responded:

"To the curious incident of the dog in the night-time."

"The dog did nothing in the night-time," said the Inspector.

"That was the curious incident," remarked Sherlock Holmes.

By asking himself what would repress the normal barking instinct of a watchdog Holmes realized that it must be the dog's recognition of his master as the criminal trespasser. In a similar way we should ask ourselves what repression keeps us from discussing something as important as immigration?

It cannot be that immigration is numerically of no consequence. Our government acknowledges a *net* inflow of 400,000 a year. Hard data are understandably lacking on the extent of illegal entries, but a not implausible figure is 600,000 per year (Buchanan 1973). The natural increase of the resident population is now about 1.7 million per year. This means that the yearly gain from immigration is at least 19%, and may be 37%, of the total increase. It is quite conceivable that educational campaigns like that of Zero Population Growth, Inc., coupled with adverse social and economic factors—inflation, housing shortage, depression, and loss of confidence in national leaders—may lower the fertility of American women to a point at which all of the yearly increase in population would be accounted for by immigration. Should we not at least ask if that is what we want? How curious it is that we so seldom discuss immigration these days!

Curious, but understandable—as one finds out the moment he publicly questions the wisdom of the status quo in immigration. He who does so is promptly charged with *isolationism, bigotry, prejudice, ethnocentrism, chauvinism, and selfishness*. These are hard accusations to bear. It is pleasanter to talk about other matters, leaving immigration policy to wallow in the cross-currents of special interests that take no account of the good of the whole—*or of the interests of posterity*.

We Americans have a bad conscience because of things we said in the past about immigrants. Two generations ago the popular press was rife with references to *Dagos*, *Wops*, *Polacks*, *Japs*, *Chinks*, and *Krauts*—all pejorative terms which failed to acknowledge our indebtedness to Goya, Leonardo, Copemicus, Hiroshige, Confucius, and Bach. Because the implied inferiority of foreigners was *then* the justification for keeping them out, it is *now* thoughtlessly assumed that restrictive policies can only be based on the assumption of immigrant inferiority. *This is not so*.

Existing immigration laws exclude idiots and known criminals; future laws will almost certainly continue this policy. But should we also consider the quality of the average immigrant, as compared with the quality of the average resident? Perhaps we should, perhaps we shouldn't. (What is "quality" anyway?) But the quality issue is not our concern here.

From this point on, *it will be assumed that immigrants and native-born citizens are of exactly equal quality*, however quality may be defined. The focus is only on quantity. The conclusions reached depend on nothing else, so all charges of ethnocentrism are irrelevant.

World food banks move food to the people, thus facilitating the exhaustion of the environment of the poor. By contrast, unrestricted immigration moves people to the food, thus speeding up the destruction of the environment in rich countries. Why poor people should want to make this transfer is no mystery: but why should rich hosts encourage it? This transfer, like the reverse one, is supported by both selfish interests and humanitarian impulses.

The principal selfish interest in unimpeded immigration is easy to identify; it is the interest of the employers of cheap labor, particularly that needed for degrading jobs. We have been deceived about the forces of history by the lines of Emma Lazarus inscribed on a plaque inside the Statue of Liberty:

Give me your tired, your poor
Your huddled masses yearning to
breathe free,
The wretched refuse of your teeming
shore,
Send these, the homeless, tempest-
tossed, to me:
I lift my lamp beside the golden
door

The image is one of an infinitely generous earth-mother, passively opening her arms to hordes of immigrants who come here on their own initiative. Such an image may have been adequate for the early days of colonization, but by the time these lines were written (1886) the force for immigration was largely manufactured inside our own borders by factory and mine owners who sought cheap labor not to be found among laborers already here. One group of foreigners after another was thus enticed into the

United States to work at wretched jobs for wretched wages.

At present, it is largely the Mexicans who are being so exploited. It is particularly to the advantage of certain employers that there be many illegal immigrants. Illegal immigrant workers dare not complain about their working conditions for fear of being repatriated. Their presence reduces the bargaining power of all Mexican-American laborers. Cesar Chavez has repeatedly pleaded with congressional committees to close the doors to more Mexicans so that those here can negotiate effectively for higher wages and decent working conditions. Chavez understands the ethics of a lifeboat.

The interests of the employers of cheap labor are well served by the silence of the intelligentsia of the country. WASPS—White Anglo-Saxon Protestants—are particularly reluctant to call for a closing of the doors to immigration for fear of being called ethnocentric bigots. It was, therefore, an occasion of pure delight for this particular WASP to be present at a meeting when the points he would like to have made were made better by a non-WASP speaking to other non-WASPS. It was in Hawaii, and most of the people in the room were second-level Hawaiian officials of Japanese ancestry. All Hawaiians are keenly aware of the limits of their environment, and the speaker had asked how it might be practically and constitutionally possible to close the doors to more immigrants to the islands. (To Hawaiians, immigrants from the other 49 states are as much of a threat as those from other nations. There is only so much room in the islands, and the islanders know it. Sophistical arguments that imply otherwise do not impress them.)

Yet the Japanese-Americans of Hawaii have active ties with the land of their origin. This point was raised by a Japanese-American member of the audience who asked the Japanese-American speaker: "But how can we shut the doors now? We have many friends and relations in Japan that we'd like to bring to Hawaii some day so that they can enjoy this beautiful land."

The speaker smiled sympathetically and responded slowly: "Yes, but we have children now and someday we'll have grandchildren. We can bring more people here from Japan only by giving away some of the land that we hope to pass on to our grandchildren some day. What right do we have to do that?"

To be generous with one's own possessions is one thing; to be generous with posterity's is quite another. This, I think, is the point that must be gotten across to those who would, from a commendable love of distributive justice, institute a ruinous system of the commons, either in the form of a world food bank or that of unrestricted immigration. Since every speaker is a member of some ethnic group it is always possible to charge him with ethnocentrism. But even after purging an argument of ethnocentrism the rejection of the commons is still valid and necessary if we are to save at least some parts of the world from environmental ruin. Is it not desirable that at least some of the grandchildren of people now living should have a decent place in which to live?

The Asymmetry of Door-Shutting

We must now answer this telling point: "How can you justify slamming the door once you're inside? You say that immigrants should be kept out. But aren't we all immigrants, or the descendants of immigrants? Since we refuse to leave, must we not, as a matter of justice and symmetry, admit all others?"

It is literally true that we Americans of non-Indian ancestry are the descendants of thieves. Should we not, then, "give back" the land to the Indians; that is, give it to the now-living Americans of Indian ancestry? As an exercise in pure logic I see no way to reject this proposal. Yet I am unwilling to live by it; and I know no one who is. Our reluctance to embrace pure justice may spring from pure selfishness. On the other hand, it may arise from an unspoken recognition of consequences that have not yet been clearly spelled out.

Suppose, becoming intoxicated with pure justice, we "Anglos" should decide to turn our land over to the Indians. Since all our other wealth has also been derived from the land, we would have to give that to the Indians, too. Then what would we non-Indians do? Where would we go? There is no open land in the world on which men without capital can make their living (and not much unoccupied land on which men with capital can either). Where would 209 million putatively justice-loving, non-Indian, Americans go? Most of them—in the persons of their ancestors—came from Europe, but they wouldn't be welcomed back there. Anyway, Europeans have no better tittle to their land than we to ours. They also would have to give up their homes. (But to whom? And where would *they* go?)

Clearly, the concept of pure justice produces an infinite regress. The law long ago invented statutes of limitation to justify the rejection of pure justice, in the interest of preventing massive disorder. The law zealously defends property rights—but only *recent* property rights. It is as

though the physical principle of exponential decay applies to property rights. Drawing a line in time may be unjust, but any other action is practically worse.

We are all the descendants of thieves, and the world's resources are inequitably distributed, but we must begin the journey to tomorrow from the point where we are today. We cannot remake the past. We cannot, without violent disorder and suffering, give land and resources back to the "original" owners—who are dead anyway.

We cannot safely divide the wealth equitably among all present peoples, so long as people reproduce at different rates, because to do so would guarantee that our grandchildren everyone's grandchildren—would have only a ruined world to inhabit.

Must Exclusion Be Absolute?

To show the logical structure of the immigration problem I have ignored many factors that would enter into real decisions made in a real world. No matter how convincing the logic may be it is probable that we would want, from time to time, to admit a few people from the outside to our lifeboat. Political refugees in particular are likely to cause us to make exceptions: We remember the Jewish refugees from Germany after 1933, and the Hungarian refugees after 1956. Moreover, the interests of national defense, broadly conceived, could justify admitting many men and women of unusual talents, whether refugees or not. (This raises the quality issue, which is not the subject of this essay.)

Such exceptions threaten to create runaway population growth inside the lifeboat, i.e., the receiving country. However, the threat can be neutralized by a population policy that includes immigration. An effective policy is one of flexible control.

Suppose, for example, that the nation has achieved a stable condition of ZPG, which (say) permits 1.5 million births yearly. We must suppose that an acceptable system of allocating birth-rights to potential parents is in effect. Now suppose that an inhumane regime in some other part of the world creates a horde of refugees, and that there is a widespread desire to admit some to our country. At the same time, we do not want to sabotage our population control system. Clearly, the rational path to pursue is the following. If we decide to admit 100,000 refugees this year we should compensate for this by reducing the allocation of birth-rights in the following year by a similar amount—that is downward to a total of 1.4 million. In that way we could achieve both humanitarian and population control goals. (And the refugees would have to accept the population controls of the society that admits them. It is not inconceivable that they might be given proportionately fewer rights than the native population.)

In a democracy, the admission of immigrants should properly be voted on. But by whom? It is not obvious. The usual rule of a democracy is votes for all. But it can be questioned whether a universal franchise is the most just one in a case of this sort. Whatever benefits there are in the admission of immigrants presumably accrue to everyone. But the costs would be seen as falling most heavily on potential parents, some of whom would have to postpone or forego having their (next) child because of the influx of immigrants. The double question *Who benefits? Who pays?* suggests that a restriction of the usual democratic franchise would be appropriate and just in this case. Would our particular quasi-democratic form of government be flexible enough to institute such a novelty? If not, the majority might, out of humanitarian motives, impose an unacceptable burden (the foregoing of parenthood) on a minority, thus producing political instability.

Plainly many new problems will arise when we consciously face the immigration question and seek rational answers. No workable answers can be found if we ignore population problems. And—if the argument of this essay is correct—so long as there is no true world government to control reproduction everywhere it is impossible to survive in dignity if we are to be guided by Spaceship ethics. Without a world government that is sovereign in reproductive matters mankind lives, in fact, on a number of sovereign lifeboats. For the foreseeable future survival demands that we govern our actions by the ethics of a lifeboat. Posterity will be ill served if we do not.

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Ethics and Population Limitation

What ethical norms should be brought to bear in controlling population growth?

Daniel Callahan

Throughout its history, the human species has been preoccupied with the conquest of nature and the control of death. Human beings have struggled to survive, as individuals, families, tribes, communities, and nations. Procreation has been an essential part of survival. Food could not have been grown, families sustained, individuals supported, or industry developed without an unceasing supply of new human beings. The result was the assigning of a high value to fertility. It was thought good to have children: good for the children themselves parents, for the society, and for species. While it may always have been granted that extenuating circumstances could create temporary contraindications to childbearing, the premise on which the value was based endured intact. There remained a presumptive right of individual procreation, a right thought to sustain the high value ascribed to the outcome: more human beings.

That the premise may now have to be changed, the value shifted, can only seem confounding. As Erik Erikson has emphasized, it is a risky venture to play with the "fire of creation," especially when the playing has implications for almost every aspect of individual and collective life (*1*). The reasons for doing so would have to be grave. Yet excessive population growth presents such reasons—it poses critical dangers to the future of the species, the ecosystem, individual liberty and welfare, and the structure of social life. These hazards are serious enough to warrant a reexamination and, ultimately, a revision of the traditional value of unrestricted procreation and increase in population.

The main question is the way in which the revision is to proceed. If the old premise—the unlimited right of and need for procreation—is to be rejected or amended, what alternative premises are available? By what morally legitimate social and political processes, and in light of what values, are the possible alternatives to be evaluated and action taken? These are ethical questions, bearing on what is taken to constitute the good life, the range and source of human rights and obligations, the requirements of human justice and welfare. If the ethical problems of population limitation could be reduced to one overriding issue, matters would be simplified. They cannot. Procreation is so

fundamental a human activity, so wide-ranging in its personal and social impact, that controlling it poses a wide range of ethical issues. My aim here is primarily to see what some of the different ethical issues are, to determine how an approach to them might be structured, and to propose some solutions.

With a subject so ill-defined as "ethics and population limitation," very little by way of common agreement can be taken for granted. One needs to start at the "beginning," with some basic assertions.

Facts and Values

There would be no concern about population limitation if there did not exist evidence that excessive population growth jeopardizes present and future welfare. Yet the way the evidence is evaluated will be the result of the values and interests brought to bear on the data. Every definition of the "population problem" or of "excessive population growth" will be value-laden, expressive of the ethical orientations of those who do the defining. While everyone might agree that widespread starvation and malnutrition are bad, not everyone will agree that crowding, widespread urbanization, and a loss of primitive forest areas are equally bad. Human beings differ in their assessments of relative good and evil. To say that excessive population growth is bad is to imply that some other state of population growth would be good or better—for example, an "optimum level of population." But as the demographic discussion of an optimum has made clear, so many variables come into play that it may be possible to do no more than specify a direction: "the desirability of a lower *rate* [italics added] of growth" (*2*).

If the ways in which the population problem is defined will reflect value orientations, these same definitions will have direct implications for the ways in which the ethical issues are posed. An apocalyptic reading of the demographic data and projections can, not surprisingly, lead to coercive proposals. Desperate problems are seen to require desperate and otherwise distasteful solutions (*3*). Moreover, how the problem is defined, and how the different values perceived to be at stake are weighted, will have direct implications for the priority given to population problems in relation to other social problems. People might well agree that population growth is a serious issue, but they might (and often do) say that other issues are comparatively more serious (*4*). If low priority is given to population problems, this is likely to affect the perception of the ethical issues at stake.

Why Ethical Questions Arise

Excessive population growth raises ethical questions because it threatens existing or desired human values and ideas of what is good. In addition, all or some of the possible solutions to the problem have the potential for creating difficult ethical dilemmas. The decision to act or not to act in the face of the threats is an ethical decision. It is a way of affirming where the human good lies and the kinds of obligations individuals and societies have toward themselves and others. A choice in favor of action will, however, mean the weighing of different options, and most of the available options present ethical dilemmas.

In making ethical choices, decisions will need to be made on (i) the human good and values that need to be served or promoted—the ends; (ii) the range of methods and actions consistent and coherent with those ends—the means; and (iii) the procedure and rationale to be used in trying to decide both upon ends and means and upon their relation to each other in specific situations—the ethical criteria for decision-making. A failure to determine the ends, both ultimate and proximate, can make it difficult or impossible to choose the appropriate means. A failure to determine the range of possible means can make it difficult to serve the ends. A failure to specify or articulate the ethical criteria for decision-making can lead to capricious or self-serving choices, as well as to the placing of obstacles in the way of a rational resolution of ethical conflicts.

In the case of ethics and the population problem, both the possibilities and the limitations of ethics become apparent. In the face of a variety of proposals to solve the population problem, some of them highly coercive, a sensitivity to the ethical issues and some greater rigor in dealing with them is imperative. The most fundamental matters of human life and welfare are at stake. Yet because of the complexity of the problem, including its variability from one nation or geographical region to the next, few hard and fast rules can be laid down about what to do in a given place at a given time.

Still, since some choices must be made (and not to choose is to make a choice as well), the practical ethical task will be that of deciding upon the available options. While I will focus on some of the proposed options for reducing birthrates, they are not the only ones possible. Ralph Potter has discussed some others (*5*).

It has generally been assumed that policy must be primarily, if not exclusively, concerned with bringing about a decline in the

rate of population increase through a reduction in the birthrate. But there are other choices. It is generally considered desirable but impossible to increase resources at a sufficient pace and through an adequate duration to preserve the present level of living for all within an expanding population. It is generally considered possible but undesirable to omit the requirement that all persons have access to that which is necessary for a good life. There is still the option of redefining what is to be considered necessary for a good life or of foregoing some things necessary for a good life in order to obtain an equitable distribution in a society that preserves the autonomy of parents to determine the size of their families.

A useful way of posing the issue practically is to envision the ethical options ranked on a preferential scale, from the most desirable to the least desirable. For working purposes, I will adopt as my own the formulation of Kenneth E. Boulding: "A moral, or ethical, proposition is a statement about a rank order of preferences among alternatives, which is intended to apply to more than one person" (*6*). Ethics enters at that point when the preferences are postulated to have a value that transcends individual tastes or inclinations. Implicitly or explicitly, a decision among alternatives becomes an ethical one when it is claimed that one or another alternative *ought* to be chosen—not just by me, but by others as well. This is where ethics differs from tastes or personal likings, which, by definition, imply nonobligatory preferences that are applicable to no more than one person (even if the tastes are shared).

General Ethical Issues

I will assume at the outset that there is a problem of excessive population growth, a problem serious for the world as a whole (with a 2 percent annual growth rate), grave for many developing nations (where the growth rate approaches 3 percent per annum), and possibly harmful for the developed nations as well (with an average 1 percent growth rate). The threats posed by excessive population growth are numerous: economic, environmental, agricultural, political, and sociopsychological. There is considerable agreement that something must be done to meet these threats. For the purpose of ethical analysis, the first question to be asked is, "In trying to meet these threats, what human ends are we seeking to serve?" Two kinds of human ends can be distinguished—proximate and ultimate.

Among the important proximate ends being sought in attempts to reduce birthrates in the developing countries are a raising of literacy rates, a reduction in dependency ratios, the elimination of starvation and malnutrition, more rapid economic development, and an improvement in health and welfare services; among these ends in the developed countries are a maintenance or improvement of the quality of life, the protection of nonrenewable resources, and the control of environmental pollution. For most purposes, it will be sufficient to cite goals of this sort. But for ethical purposes, it is critical to consider not just proximate, but ultimate ends as well. For it is legitimate to ask of the specified proximate ends what ultimate human ends they are meant to serve. Why is it important to raise literacy rates? Why is it necessary to protect nonrenewable resources? Why ought the elimination of starvation and malnutrition to be sought? For the most part, these are questions that need not be asked or that require no elaborate answers. The ethical importance of such questions is that they force us to confront the goals of human life. Unless these goals are confronted at some point, ethics cannot start or finish

Philosophically, solving the population problem can be viewed as determining at the outset what final values should be pursued. The reason, presumably, that a reduction in illiteracy rates is sought is that it is thought valuable for human beings to possess the means of achieving knowledge. The elimination of starvation and malnutrition is sought because of the self-evident fact that human beings must eat to survive. The preservation of nonrenewable resources is necessary in order that human life may continue through future generations. There is little argument about the validity of these propositions, because they all presuppose some important human values: knowledge, life, and survival of the species, for instance. Historically, philosophers have attempted to specify what, in the sense of "the good," human beings essentially seek. What do they, in the end, finally value? The historical list of values is long: life, pleasure, happiness, knowledge, freedom, justice, and self-expression, among others.

This is not the place to enter into a discussion of all of these values and the philosophical history of attempts to specify and rank them. Suffice it to say that three values have had a predominant role, at least in the West: freedom, justice, and security-survival. Many of the major ethical dilemmas posed by the need for population limitation can be reduced to ranking and interpreting these three values. Freedom is prized because it is a condition for self-determination and the achievement of knowledge. Justice, particularly distributive justice, is prized because it entails equality of treatment and

opportunity and an equitable access to those resources and opportunities necessary for human development. Security-survival is prized because it constitutes a fundamental ground for all human activities.

Excessive population growth poses ethical dilemmas because it forces us to weight and rank these values in trying to find solutions. How much procreative freedom, if any, should be given up in order to insure the security-survival of a nation or a community? How much security-survival can be risked in order to promote distributive justice? How much procreative freedom can be tolerated if it jeopardizes distributive justice?

Ethical dilemmas might be minimized if there were a fixed agreement on the way the three values ought to be ranked. One could say that freedom is so supreme a value that both justice and security-survival should be sacrificed to maintain it. But there are inherent difficulties in taking such a position. It is easily possible to imagine situations in which a failure to give due weight to the other values could result in an undermining of the possibility of freedom itself. If people cannot survive at the physical level, it becomes impossible for them to exercise freedom of choice, procreative or otherwise. If the freedom of some is unjustly achieved at the expense of the freedom of others, then the overall benefits of freedom are not maximized. If security-survival were given the place of supremacy, situations could arise in which this value was used to justify the suppression of freedom or the perpetuation of social injustice. In that case, those suppressed might well ask, "Why live if one cannot have freedom and justice?"

For all of these reasons it is difficult and perhaps unwise to specify a fixed and abstract rank order of preference among the three values. In some circumstances, each can enter a valid claim against the others. In the end, at the level of abstractions, one is forced to say that all three values are critical; none can permanently be set aside.

The Primacy of Freedom

In the area of family planning and population limitation, a number of national and international declarations have given primacy to individual freedom. The Declaration of the 1968 United Nations International Conference on Human Rights is representative (*7*, *8*): "...couples have a basic human right to decide freely and responsibly on the number and spacing of their children and a right to adequate education and information in this respect." While this primacy of individual freedom has been challenged (*9*), it retains its position, serving as the ethical and political foundation of both domestic and foreign family planning and population policies. Accordingly, it will be argued here that (i) the burden of proof for proposals to limit freedom of choice (whether on the grounds of justice or security-survival) rests with those who make the proposals, but that (ii) this burden can, under specified conditions, be discharged if it can be shown that a limitation of freedom of choice in the name of justice or security-survival would tend to maximize human welfare and human values. This is only to say that, while the present international rank order of preference gives individual freedom primacy, it is possible to imagine circumstances that would require a revision of the ranking.

One way of approaching the normative issues of ranking preferences in population limitation programs and proposals is by locating the key ethical actors, those who can be said to have obligations. Three groups of actors can be identified: individuals (persons, couples, families), the officers and agents of voluntary (private-external) organizations, and the government officials responsible for population and family planning programs. I will limit my discussion here to individuals and governments. What are the ethical obligations of each of the actors? What is the right or correct course of conduct for them? I will approach these questions by first trying to define some general rights and obligations for each set of actors and then by offering some suggested resolutions of a number of specific issues.

I begin with individuals (persons, couples, families) because, in the ranking of values, individual freedom of choice has been accorded primacy by some international forums—and it is individuals who procreate. What are the rights and obligations of individuals with regard to procreation?

Individuals have the right voluntarily to control their own fertility in accordance with their personal preferences and convictions (*7*, p. 15). This right logically extends to a choice of methods to achieve the desired control and the right to the fullest possible knowledge of available methods and their consequences (medical, social, economic, and demographic, among others).

Individuals are obligated to care for the needs and respect the rights of their existing children (intellectual, emotional, and physical); in their decision to have a child (or another child), they must determine if they will be able to care for the needs and respect the rights of the child-to-be. Since individuals are obliged to respect the rights of others,

they are obliged to act in such a way that these rights are not jeopardized. In determining family size, this means that they must exercise their own freedom of choice in such a way that they do not curtail the freedom of others. They are obliged, in short, to respect the requirements of the common good in their exercise of free choice (*10*). The source of these obligations is the rights of others.

The role of governments in promoting the welfare of their citizens has long been recognized. It is only fairly recently, however, that governments have taken a leading role in an antinatalist control of fertility (*11*). This has come about by the establishment, in a number of countries, of national family planning programs and national population policies. While many countries still do not have such policies, few international objections have been raised against the right of nations to develop them. So far, most government population policies have rested upon and been justified in terms of an extension of freedom of choice. Increasingly, though, it is being recognized that, since demographic trends can significantly affect national welfare, it is within the right of nations to adopt policies designed to reduce birthrates and slow population growth.

A preliminary question must, therefore, be asked. Is there any special reason to presume or suspect that governmental intervention in the area of individual procreation and national fertility patterns raises problems which, in *kind*, are significantly different from other kinds of interventions? To put the question another way, can the ethicopolitical problems that arise in this area be handled by historical and traditional principles of political ethics, or must an entirely new ethic be devised?

I can see no special reason to think that the formation of interventionist, antinatalist, national population policies poses any unique *theoretical* difficulties. To be sure, the perceived need to reduce population growth is historically new; there exists no developed political or ethicopolitical tradition dealing with this specific problem. Yet the principle of governmental intervention in procreation-related behavior has a long historical precedent: in earlier, pronatalist population policies, in the legal regulation of marriage, and in laws designed to regulate sexual behavior. It seems a safe generalization to say that governments have felt (and generally have been given) as much right to intervene in this area as in any other where individual and collective welfare appears to 'be at stake. That new forms of intervention may seem to be called for or may be proposed (that is, in an anti- rather than pronatalist direction) does not mean that a new ethical or political principle is at issue. At least, no such principle is immediately evident.

Yet, if it is possible to agree that no new principles are involved, it is still possible to argue that a further extension of an old principle—the right of government intervention into procreation-related behavior—would be wrong. Indeed, it is a historical irony that, after a long international struggle to establish individuals' freedom of choice in controlling their own fertility, that freedom should immediately be challenged in the name of the population crisis. Irony or not, there is no cause to be surprised by such a course of events. The history of human liberty is studded with instances in which, for a variety of reasons, it has been possible to say that liberty is a vital human good and yet that, for the sake of other goods, restriction of liberty seems required. A classical argument for the need of a government is that a formal and public apparatus is necessary to regulate the exercise of individual liberty for the sake of the common good.

In any case, the premise of my discussion will be that governments have as much right to intervene in procreation-related behavior as in other areas of behavior affecting the general welfare. This right extends to the control of fertility in general and to the control of individual fertility in particular. The critical issue is the way in which this right is to be exercised—its conditions and limits—and that issue can only be approached by first noting some general issues bearing on the restriction of individual freedom of choice by governments.

Governments have the right to take those steps necessary to insure the preservation and promotion of the common good—the protection and advancement of the right to life, liberty, and property. The maintenance of an orderly and just political and legal system, the maintenance of internal and external security, and an equitable distribution of goods and resources are also encompassed within its rights. Its obligations are to act in the interests of the people, to observe human rights, to respect national values and traditions, and to guarantee justice and equality. Since excessive population growth can touch upon all of these elements of national life, responses to population problems will encompass both the rights and the obligations of governments. However, governmental acts should represent collective national decisions and be subject to a number of stipulations.

I now recapitulate the points made so far and summarize some propositions, which I then use to suggest solutions to some specific ethical issues.

1) General moral rules: (i) individuals have the right to freedom of procreative choice, and they have the obligation to respect the freedom of others and the requirements of their common good; (ii) governments have the right to take those steps necessary to secure a maximization of freedom, justice, and security-survival, and they have the obligation to act in such a way that freedom and justice are protected and security-survival enhanced.

2) Criteria for ethical decision-making: (i) one (individual, government, organization) is obliged to act in such a way that the fundamental values of freedom, justice, and security-survival are respected; (ii) in cases of conflict, one is obliged to act in such a way that any limitation of one or more of the three fundamental values—a making of exceptions to the rules concerning these values—continues to respect the values and can be justified by the promise of increasing the balance of good over evil.

3) Rank order of preference: (i) those choices of action that ought to be preferred are those that accord primacy to freedom of choice; (ii) if conditions appear to require a limitation of freedom, this should be done in such a way that the direct and indirect harmful consequences are minimized and the chosen means of limitation are just—the less the harm, the higher the ranking.

Some Specific Ethical Issues

Since it has already been contended that individual freedom of choice has primacy, the ethical issues to be specified here will concentrate on those posed for governments. This focus will, in any event, serve to test the limits of individual freedom.

Faced with an excessive population growth, a variety of courses are open to governments. They can do nothing at all. They can institute, develop, or expand voluntary family planning programs. They can attempt to implement proposals that go "beyond family planning" (*12*).

Would it be right for governments to go beyond family planning if excessive population growth could be shown to be a grave problem? This question conceals a great range of issues. Who would decide if governments have this right? Of all the possible ways of going beyond family planning, which could be most easily justified and which would be the hardest to justify? To what extent would the problem have to be shown to be grave? As a general proposition, it is possible ethically to say that governments would have the right to go beyond family planning. The obligation of governments to protect fundamental values could require that they set aside the primacy of individual freedom in order to protect justice and security- survival. But everything would depend on the way they proposed to do so.

Would it be right for government to establish involuntary fertility controls? These might include (if technically feasible) the use of a mass "fertility control agent," the licensing of the right to have children, compulsory temporary or permanent sterilization, or compulsory abortion (*12*). Proposals of this kind have been put forth primarily as "last resort" methods, often in the context that human survival may be at stake. "Compulsory control of family size is an unpalatable idea to many," the Ehrlichs have written, "but the alternatives may be much more horrifying . . . human survival seems certain to require population control programs. . . ." (*3*, p. 256) Their own suggestion is manifestly coercive: "If . . . relatively uncoercive laws should fail to bring the birthrate under control, laws could be written that would make the bearing of a third child illegal and that would require a abortion to terminate all such pregnancies" (*3*, p. 274).

That last suggestion requires examination. Let us assume for the moment that the scientific case has been made that survival itself is at stake and that the administrative and enforcement problems admit of a solution. Even so, some basic ethical issues would remain. "No one," the United Nations has declared, "shall be subjected to torture or to cruel, inhuman, or degrading treatment or punishment" (*13*, Article 5). It is hard to see how compulsory abortion, requiring governmental invasion of a woman's body, could fail to qualify as inhuman or degrading punishment. Moreover, it is difficult to see how this kind of suggestion can be said to respect in any way the values of freedom and justice. It removes free choice altogether, and in its provision for an abortion of the third child makes no room for distributive justice at all; its burden would probably fall upon the poorest and least educated. It makes security-survival the prime value, but to such an extent and in such a way that the other values are ignored altogether. But could not one say, when survival itself is at stake, that this method would increase the balance of good over evil? The case would not be easy to make (i) because survival is not the only human value at stake; (ii) because the social consequences of such a law could be highly destructive (for example, the inevitably massive fear and anxiety about third pregnancies that would result from such a law); an (iii) because it would be almost impossible to show that this is the *only* method that

would or could work to achieve the desired reduction in birth rates.

Would it be right for government to develop "positive" incentive programs, designed to provide people with money or goods in return for regulation of their fertility? These programs might include financial reward for sterilization, for the use of contraceptives, for periods of nonpregnancy or nonbirth, and for family planning bonds or "responsibility prizes" (*12*, p. 2). In principle, incentive schemes are noncoercive; that is, people are not forced to take advantage of the incentive. Instead, the point of an incentive is to give them a choice they did not previously have.

Yet there are a number of ethical questions about incentive plans. To whom would they appeal most? Presumably, their greatest appeal would be to the poor, those who want or need the money or goods offered by an incentive program; they would hold little appeal for the affluent, who already have these things. Yet if the poor desperately need the money or goods offered by the incentive plan, it is questionable whether, in any real sense, they have a free choice. Their material needs may make the incentive seem coercive to them. Thus, if it is only or mainly the poor who would find the inducements of an incentive plan attractive, a question of distributive justice is raised. Because of their needs, the poor have less choice than the rich about accepting or rejecting the incentive; this could be seen as a form of exploitation of poverty. In sum, one can ask whether incentive schemes are or could be covertly coercive, and whether they are or could be unjust (*14*). If so, then while they may serve the need for security-survival, they may do so at the expense of freedom and justice.

At least three responses seem possible. First, if the need for security-survival is desperate, incentive schemes might well appear to be the lesser evil, compared with more overtly coercive alternatives. Second, the possible objections to incentive schemes could be reduced if, in addition to reducing births, they provided other benefits as well. For instance, a "family planning bond" program would provide the additional benefit of old-age security (*15*). Any one of the programs might be defended on the grounds that those who take advantage of it actually want to control births in any case (if this can be shown). Third, much could depend upon the size of the incentive benefits. At present, most incentive programs offer comparatively small rewards; one may doubt that they offer great dilemmas for individuals or put them in psychological straits. The objection to such programs on the grounds of coercion would become most pertinent if it can be shown that the recipients of an incentive benefit believe they have no real choice in the matter (because of their desperate poverty or the size of the benefit); so far, this does not appear to have been the case (*16*).

While ethical objections have been leveled at incentive programs because of some experienced corrupt practices in their implementation, this seems to raise less serious theoretical issues. Every program run by governments is subject to corruption; but there are usually ways of minimizing it (by laws and review procedures, for instance). Corruption, I would suggest, becomes a serious theoretical issue only when and if it can be shown that a government program is *inherently* likely to create a serious, inescapable, and socially damaging system of corruption. This does not appear to be the case with those incentive programs so far employed or proposed.

Would it be right for governments to institute "negative" incentive programs? These could take the form of a withdrawal of child or family allowances after a given number of children, a withdrawal of maternity benefits after a given number, or a reversal of tax benefits, to favor those with small families (*12*, p. 2). A number of objections to such programs have been raised. They are directly coercive in that they deprive people of free choice about how many children they will have by imposing a penalty on excess procreation; thus they do not attach primary importance to freedom of choice. They can also violate the demands of justice, especially in those cases where the burden of the penalties would fall upon those children who would lose benefits available to their siblings. And the penalties would probably be more onerous to the poor than to the rich, further increasing the injustice. Finally, from quite a different perspective, the social consequences of such programs could be most undesirable. They could, for instance, worsen the health and welfare of those mothers, families, and children who would lose needed social and welfare benefits. Moreover, such programs could be patently unjust in those places where effective contraceptives do not exist (most places at present). In such cases, people would be penalized for having children whom they could not prevent with the available birth control methods.

It is possible to imagine ways of reducing the force of these objections. If the penalties were quite mild, more symbolic than actual [as Garrett Hardin has proposed (*17*)], the objection from the viewpoint of free choice would be less; the same would apply to the objection from the viewpoint of justice.

to deprive them of the necessities of life, in the name of saving even more lives at a later date cannot be justified in the name of a greater preponderance of good over evil. There could be no guarantee that those future lives would be saved, and there would be such a violation of the rights of the living (including the right to life) that fundamental human values would be sacrificed.

Would it be right for a government to institute programs that go beyond family planning -- particularly in a coercive direction—for the sake of future generations? This is a particularly difficult question, in great part because the rights of unborn generations have never been philosophically, legally, or ethically analyzed in any great depth (*22*). On the one band, it is evident that the actions of one generation can have profound effects on the option available to future generations. And just as those living owe much of their own welfare to those who precede them (beginning with their parents) so, too, the living would seem to have obligations to the unborn. On the other hand, though, the living themselves have rights—not just potential, but actual. To set aside these rights, necessary for the dignity of the living, in favor of those not yet living would, I think, be to act arbitrarily.

A general solution might, however be suggested. While the rights of the living should take precedence over the rights of unborn generations, the living have an obligation to refrain from actions that would endanger future generations' enjoyment of the same rights that the living now enjoy. This means, for instance, that the present generation should not exhaust nonrenewable resources, irrevocably pollute the environment, or procreate to such an extent that future generations will be left with an unmanageably large number of people. All of these obligations imply a restriction of freedom. However, since the present generation does have the right to make use of natural resources and to procreate, it must be demonstrated (not just asserted that the conduct of the present generation poses a direct threat to the rights of future generations. In a word, the present generation cannot be deprived of rights on the basis of vague speculations about the future or uncertain projections into the future.

Do governments have the right unilaterally to introduce programs that go beyond family planning? It is doubtful that they do. Article 21 of the "Universal Declaration of Human Rights" (*13*) asserts that "Everyone has the right to take part in the government of his country, directly or through freely chosen representatives . . . . The will of the people shall be the basis of the authority of government." There is no evident reason that matters pertaining to fertility control should be exempt from the requirements of this right. By implication, not only measures that go beyond family planning, but family planning programs as well require the sanctions of the will of the people and the participation of the people in important decisions.

A Ranking of Preferences

The preceding list of specific issues by no means exhausts the range of possible ethical issues pertaining to governmental action; it is meant only to be illustrative of some of the major issues. Moreover, the suggested solutions are only illustrative. The complexities of specific situations could well lead to modifications of them. That is why ethical analysis can rarely ever say exactly what ought to be done in x place at y time by z people. It can suggest general guidelines only.

I want now to propose some general ethical guidelines for governmental action, ranking from the most preferable to the least preferable.

1) Given the primacy accorded freedom of choice, governments have an obligation to do everything within their power to protect, enhance, and implement freedom of choice in family planning. This means the establishment, as the first order of business, of effective voluntary family planning programs.

2) If it turns out that voluntary programs are not effective in reducing excessive population growth, then governments have the right, as the next step, to introduce programs that go beyond family planning. However, in order to justify the introduction of such programs, it must be shown that voluntary methods have been adequately and fairly tried, and have nonetheless failed and promise to continue to fail. It is highly doubtful that, at present, such programs have "failed"; they have not been tried in any massive and systematic way (*23*).

3) In choosing among possible programs that go beyond family planning, governments must first try those which, comparatively, most respect freedom of choice (that is, are least coercive). For instance, they should try "positive" incentive programs and manipulation of social structures before resorting to "negative" incentive programs and involuntary fertility controls.

4) Further, if circumstances force a government to choose programs that are quasi- or wholly coercive, they can justify such programs if, and only if, a number of prior conditions have been met: (i) if, in the light of the primacy of free choice,

a government has discharged the burden of proof necessary to justify a limitation of free choice—and the burden of proof is on the government (this burden may be discharged by a demonstration that continued unrestricted liberty poses a direct threat to distributive justice or security-survival); and (ii) if, in light of the right of citizens to take part in the government of their country, the proposed limitations on freedom promise, in the long run, to increase the options of free choice, decisions to limit freedom are collective decisions, the limitations on freedom are legally regulated and the burden falls upon all equally, and the chosen means of limitation respect human dignity, which will here be defined as respecting those rights specified in the United Nations' "Universal Declaration of Human Rights" (*13*). The end—even security-survival—does not justify the means when the means violate human dignity and logically contradict the end.

As a general rule, the more coercive the proposed plan, the more stringent should be the conditions necessary to justify and regulate the coercion. In addition, one must take account of the possible social consequences of different programs, consequences over and above their impact on freedom, justice, and security-survival. Thus, if it appears that some degree of coercion is required, that policy or program should be chosen which (i) entails the least amount of coercion, (ii) limits the coercion to the fewest possible cases, (iii) is most problem-specific, (iv) allows the most room for dissent of conscience, (v) limits the coercion to the narrowest possible range of human rights, (vi) threatens human dignity least, (vii) establishes the fewest precedents for other forms of coercion, and (viii) is most quickly reversible if conditions change.

While it is true to say that social, cultural, and political life requires, and has always required, some degree of limitation of individual liberty—and thus some coercion—that precedent does not, in itself, automatically justify the introduction of new limitations (*24*). Every proposal for a new limitation must be justified in its own terms—the specific form of the proposed limitation must be specifically justified. It must be proved that it represents the least possible coercion, that it minimizes injustice to the greatest extent possible, that it gives the greatest promise of enhancing security- survival, and that it has the fewest possible harmful consequences (both short- and long-term).

Freedom and Risk-Taking

The approach I have taken to the ethics of population limitation has been cautionary. I have accepted the primacy of freedom of choice as a given not only because of its primacy in United Nations and other declarations, but also because it is a primary human value. I have suggested that the burden of proof must lie with those proposals, policies, or programs that would place the primacy elsewhere. At the same time, I have laid down numerous conditions necessary to discharge the burden of proof. Indeed, these conditions are so numerous, and the process of ethical justification so difficult, that the possibility of undertaking decisive action may seem to have been excluded. This is a reasonable concern, particularly if time is short. Is it reasonable to give the ethical advantage to freedom of choice (*25*)? Does this not mean that a great chance is being taken? Is it not unethical to take risks of that sort, and all the more so since others, rather than ourselves, will have to bear the burden if the risk-taking turns out disastrously? In particular, would it not be irresponsible for governments to take risks of this magnitude?

Three kinds of responses to the questions are possible. First, as mentioned, it can and has been argued that freedom of choice has not been adequately tested. The absence of a safe, effective, and inexpensive contraceptive has been one hindrance, particularly in developing countries; it is reasonable to expect that such a contraceptive will eventually be developed. The weakness of existing family planning programs (and population policies dependent upon them) has, in great part, been the result of inadequate financing, poor administration, and scanty research and survey data. These are correctable deficiencies, assuming that nations give population limitation a high priority. If they do not give population limitation a high priority, it is unlikely that more drastic population policies could be successfully introduced or implemented. Very little effort has been expended anywhere in the world to educate people and persuade them to change their procreation habits. Until a full-scale effort has been made, there are few good grounds for asserting that voluntary limitation will be ineffective.

Second, while the question of scientific-medical-technological readiness, political viability, administrative feasibility, economic capability, and assumed effectiveness of proposals that would go beyond family planning is not directly ethical in nature, it has important ethical implications. If all of these categories seem to militate against the practical

possibility of instituting very strong, immediate, or effective coercive measures, then it could become irresponsible to press for or support such measures. This would especially be the case if attention were diverted away from what could be done, for example, an intensification of family planning programs.

Third, primacy has been given to freedom of choice for ethical reasons. Whether this freedom will work as means of population limitation is a separate question. A strong indication that freedom of choice will be ineffective does not establish grounds for rejecting it. Only if it can be shown that the failure of this freedom to reduce population growth threatens other important human values, thus establishing a genuine conflict of values, would the way be open to remove it from the place of primacy. This is only another way of asserting that freedom of choice is a right, grounded in a commitment to human dignity. The concept of a "right" become meaningless if rights are wholly subject to tests of economic, social, or demographic utility, to be given or withheld depending upon their effectiveness in serving social goals.

In this sense, to predicate human rights at all is to take a risk. It is to assert that the respect to be accorded human beings ought not to be dependent upon majority opinion, cost-benefit analysis, social utility, governmental magnanimity, or popular opinion. While it is obviously necessary to adjudicate conflicts among rights, and often to limit one right in order to do justice to another, the pertinent calculus is that of rights, not of utility. A claim can be entered against the primacy of one right only in the name of one or more other important rights. The proper route to a limitation of rights is not directly from social facts (demographic, economic, and so on) to rights, as if these facts were enough in themselves to prove the case against a. right. The proper route is from showing that the social facts threaten rights, and in what way, to showing that a limitation of one right may be necessary to safeguard or enhance other rights. To give primacy to the right of free choice is to take a risk. The justification for the risk is the high value assigned to the right, a value that transcends simply utilitarian considerations.

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1. E. H. Erikson, *Insight and Responsibility*, (Norton, New York, 1964), p. 132.

2. B. Berelson, in *Is There an Optimum Level of Population?*, S. F. Singer, Ed. (McGraw- Hill, New York, 1971), p. 305.

3.See, for instance, P. R. Ehrlich and A. H. Ehrlich, *Population, Resources, Environment Issues in Human Ecology* (Freeman, San Francisco, 1970), pp. 321-324.

4. A 1967 Gallup Poll, for example, revealed that, while 54 percent of those surveyed felt that the rate of American population growth posed a serious problem, crime, racial discrimination, and poverty were thought to be comparatively more serious social problems. J. F. Kanther, *Stud. Fam. Plann.* No. 30 (May 1968), p. 6.

5. R. B. Potter, Jr., *in Freedom, Coercion and the Life Sciences*, L. Kass and D. Callahan, Eds., in press.

6. K. E. Boulding, *Amer. Econ. Rev.* 59, 1 (March 1969).

7. *Final Act of the International Conference on Human Rights* (United Nations, New York, 1968), p.15.

8. "Declaration on Population: The World Leaders Statement," *Stud. Fam. Plann.* No. 26 (January 1968), p 1.

9. For instance, not only has Garrett Hardin, in response to the "The World Leaders' Statement" (8), denied the right of the family to choose family size, he has also said that "If we love the truth we must openly deny the validity of the Universal Declaration of Human Rights, even though it is promoted by the United Nations" [*Science* 162, 1246 (1968)]. How literally is one to take this statement? The declaration, after all, affirms such rights as life, liberty, dignity, equality, education, privacy, and freedom of thought. Are none of these rights valid? Or, if those rights are to remain valid, why is only the freedom to control family size to be removed from the list?

10. See A. S. Parkes, in *Biology and Ethics*, F. J. Ebling, Ed. (Academic Press, New York, 1969), pp. 109-116.

11. In general, "antinatalist" means "attitudes or policies directed toward a reduction of births," and "pronatalist" means "attitudes or policies directed toward an increase in births."

12. See B. Berelson, *Stud. Fam. Plann.* No. 38 (February 1969), p. 1.

13. "Universal Declaration of Human Rights," in *Human Rights: A Compilation of International Instruments of the United Nations* (United Nations, New York, 1967).

14. See E. Pohlman and K. G. Rao, *Licentiate* 17, 236 (1967).

15. See, for instance, R. G. Ridker, *Stud. Fam. Plann.* No. 43 (June 1969), p. 11.

16. The payments made in six different family planning programs are listed in *Incentive Payments in Family Planning Programmes* (International Planned Parenthood Federation, London, 1969), pp. 8-9.

17. G. Hardin, *Fam. Plann. Perspect.* 2, 26 (June 1970).

18. See, for example, W. H. Davis, *New Repub.* (20 June 1970), p. 19.

19. P. R. Ehrlich, *The Population Bomb* (Ballantine Books, New York, 1968), pp. 158-173.

20. See the "International Covenant on Economic, Social and Cultural Rights," Article 1, section 1, paragraph 1, in *Human Rights: A Compilation of International Instruments of the United Nations* (United Nations, New York, 1967), p. 4: "All people have the right to self-determination. By virtue of that right they freely determine their political status and freely pursue their economic, social and cultural development."

21. "Everyone has the right to life, liberty and the security of person" (13).

22. One of the few recent discussions on the obligation to future generations is in M. P. Gelding [*UCLA Law Review* 15, 457 (February 1968)].

23. See D. Nortman, in *Reports on Population Family Planning* (Population Council, New York, December 1969), pp. 1-48. Judith Blake is pessimistic about the possibilities of family planning programs [*J. Chronic Dis.* 18, 1181 (1965)]. See also J. Blake [*Science* 164, 522 (1969)] and the reply of 0. Harkavy, F. S. Jaffe, S. M. Wishik [*ibid.* 165, 367 (1969)].

24. See E. Pohlman, *Eugen. Quart.* 13, 122 (June 1966): "The spectre of 'experts' monkeying around with such private matters as family size desires frightens many people as being too 'Big Brotherish.' But those involved in eugenics, or psychotherapy, or child psychology, or almost any aspect of family planning are constantly open to the charge of interfering in private lives, so that the charge would not be new... Of course, many injustices have been done with the rationale of being 'for their own good.' But the population avalanche may be used to justify—perhaps rationalize—contemplation of large-scale attempts to manipulate family size desires, even rather stealthily." This mode of reasoning may explain how some people will think and act, but it does not constitute anything approaching an ethical justification.

25. P. R. Ehrlich (19, pp. 197-198) argues that the taking of strong steps now to curb population growth is the wiser and safer gamble than doing nothing or too little. This seems to me a reasonable enough position, up to a point. That point would come when the proposed steps would seriously endanger human dignity; an ethic of survival, at the cost of other basic human values, is not worth the cost.

26. This article is an abridgment of an "Occasional Paper" *[Ethics and Population Limitation* (Population Council, New York, 1971)] and was written while the author was a staff associate at the Population Council in 1969-70. 1 would particularly like to thank Bernard Berelson for his suggestions and criticisms.

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Sui Genocide

The human species might yet fulfill its evolutionary potential, if it would only go away

How, if at all, will the 1990s be remembered? The Internet rose and the Soviet Union fell. Mammals were cloned, Bosnia broke up, and peace came to Ireland, maybe. Something happened in Canada, though no one was sure precisely what. On the whole it has been a decade like any other, agreeably dull. In a thousand years, or in ten thousand or a hundred thousand, what will matter? Mainly an event which hardly anyone noticed at the time: the first, tentative sprouting of an idea which can transfigure humanity.

Thank—if you think it cause for thanks—Les U. Knight of Portland, Oregon. Great ideas sometimes have peculiar beginnings, and Mr. Knight is a case in point. He knows that the idea for which he acts as principal spokesman is featured in a book called "Kooks: A Guide to the Outer Limits of Human Belief", and on a related website called "Kooks Museum". This does not trouble him, since he is lucky to be listed in any sort of reference work at all. "I don't mind being considered a kook; somebody's got to do it," he says in his gentle, almost musical baritone. "This is the natural progression of ideas. First we have to be ridiculed." In that, if in nothing else, the Voluntary Human Extinction Movement looks set for creditable success.

Mr Knight is a middle-aged substitute teacher in Portland's secondary schools, but it is for his avocation that history should remember him. Around 1970, when he was back from service in the Vietnam war and was finishing university, he became interested in the environmental movement, which was just celebrating its first Earth Day. This sparked a number of changes in his personal philosophy (and also the insertion of the "U." into his name). "It took a very short time to see that all of the environmental solutions were linked to the number of people on the planet," he says. He joined a group called Zero Population Growth, but soon saw that this was no permanent solution. "That's when I realised that the best thing for the planet would be for us to phase ourselves out completely."

In his imagination, if nowhere else, Mr Knight became the founder of the Human Extinction Movement; but over time he realised that the name he had chosen missed the central element which sets his vision apart as both liberal and sublime. "It's got to be voluntary," he says—a Voluntary Human

Extinction Movement (VHEMT, pronounced, he intones, "vehement", because that is what they are). There is more than enough coercion in the world already, he reckons, and in any case governments that cannot manage forests should not be expected to manage people.

Since 1991 he has used newsletters to ask people to become Movement "volunteers" by forswearing procreation. The task, he concedes, is difficult, but the longest journey begins with a single step. "I consider it a success every time one more of us decides not to add one more of us." The movement has no organisation or membership list, and consists of anyone who supports the idea. How many followers it boasts is impossible to say. In 1995 Daniel Metz, a Willamette University researcher, counted close to 400 people on Mr Knight's mailing list, and even managed to survey them. The supporters tend to believe two things: that humans will soon face a massive "die-off" as population surges past the planet's carrying capacity, and that humans would do the world a favour by going away, because their continuation obliterates so many other species.

"In a short time," says a middle-aged New Yorker, in an e-mail to your correspondent, "we'll see the unmistakable signs of the next big population crash." Meanwhile, so long as humans continue, we wreak destruction. "We can't help it," avers a vehement woman from Jersey City, "and we can't stop ourselves—we simply must strip the earth of all natural resources, and drive other species to extinction, for our own short-term benefit."

It must be said, with all respect, that neither rationale is quite compelling. The notion of a growing number of people fighting over a fixed resource pie is Malthusian bosh, as this newspaper has argued in the past. Human ingenuity, energised by sensible policies, creates resources faster than people use them; people learn to substitute sand (in the form of microchips) for sweat, and fuel cells for petrol engines. The second contention—that humanity owes it to other species to die off—is a little harder to dismiss. The egalitarian premise that *Homo sapiens* has no innate moral precedence over other species, which human activity does indeed obliterate at an impressive rate, is one you must simply take or leave. If you take it, then at a minimum humans should find ways to leave a smaller footprint. Still, that argues for better conservation, or perhaps for fewer humans. It is not a compelling argument for no humans at all.

At about this point in the article, the clever reader begins to wonder why a serious newspaper is wasting ink on such silly ideas. The answer is that once in a while someone comes up with the right idea for the wrong reasons. Mr Knight's notion of voluntary human extinction is one of those profoundly right ideas.

Consider, in this connection, a question so obvious, and so important, that it has rarely if ever been posed: Why should there always be a next generation? Of course parents will make one, at least for the foreseeable future, but to say they have no choice in the affair is a reply suitable for a bacillus or a slime mould or a tumour, not for a thinking being. The command to make children and grandchildren, to be fruitful and multiply for ever and ever, is an imperative of the genes, not the mind. Humans will be the slaves of two little coils of nucleotide bases so long as they fail to take into their own hands the ultimate question, which is how long the People Show should go on.

An exit chosen, not ordained

It is clear that human history will end; the only mystery is when. It is also clear that if the timing is left to nature (or, if you prefer, to God) and humans hang on until the bloody end, the race's final exit will be ignoble. If future generations escape the saurian agony of extermination by a wandering chunk of rock or ice, the sun's unavoidable growth to gianthood will still incinerate their last successors: only cinders and gases and dust will remain.

Far future generations might prolong the process by posting colonies beyond the earth's orbit, but these would be sad outposts at the end of the solar system's long day, clutching memories of a lost planet and of billions of immolated souls. The difficulties—fantastic difficulties—of interstellar travel might be overcome, but the mightiest of starships could do no more than defer the *dies irae*. An ignoble existence hopping from planet to planet—clinging to each clod until it, in its turn, was vaporised or frozen—might still be bearable were it not for the knowledge of its final futility. In the end, there is only death by gravity or entropy, the fiery quantum pit or the heatless grey soup. In the end, there is only the fiery quantum pit or the heatless grey soup.

The great violinist Jascha Heifetz was great not least because he quit the concert stage at his peak, before the show became stale or the audience drifted away. To exit gracefully is sublime, as Heifetz understood. And only one species is capable of choosing a similarly graceful exit; all others march on like robots. To call time on the human race

by choice, not necessity, would be the final victory of the human spirit over animal nature, an absolute emancipation from the diktat of DNA. Precisely because no other known life-form could do or even conceive such a thing, humanity must.

More: science has revealed only one place in the universe that is hospitable to intelligent life, and humans are the only intelligence that, as far as is known, has ever enjoyed the opportunity to occupy it. If people left the stage after a reasonable run, in the fullness of time intelligence could evolve again (dolphin-people? chimp-people? orchid people?). And then, in due course, when this new species deciphered human books or reached the marker that might be left for them on the windless moon, they would know that man ended his dominion so that theirs might begin. Imagine, then, how they will regard us. It is, far and away, the greatest act of goodness ever contemplated, the ennoblement of a whole species; an act, almost, of angels.

By departing the scene humanity will leave much undiscovered, much unexplored and unfinished. Perhaps in the reaches of space there is life, or even intelligence: a pity to extinguish the race before meeting it. Yet the future is always an unwritten page, and the nobility of voluntary extinction resides precisely in shutting the book at a time of our own choosing. To make contact with an alien race while still alive would be interesting, for a while; but mankind will doubtless make a better impression posthumously. Then the aliens will know the ancients of earth as a legendary race that gave itself back to the dust and the stars. They will speak of us with awe to their children for as long as, ignoring our example, they continue to have any.

Imagine the poetry, the music, of those last few human generations; imagine the moral exaltation of those last few souls, the pregnant richness of sound and light and colour and even of thought in the last months of humanity's twilight. Who would not give everything to know the ineffable sadness and nobility of being among the last? Then, at last, the lights will go out, and the world will begin anew, and the sand will cover our name. That would be a finale worthy of a great race.

It is hard, indeed, to imagine any reason to be against voluntary human extinction. The tricky question is not whether to extinguish, but when. Certainly not right away, if only because, as yet, we can't. As Mr Knight himself says, "Convincing 6 billion people to stop breeding is indeed a daunting task." But there need be no rush. Look at it this way. For humans to reach a state of such collective rational consensus that they become capable of choosing their end may take a few millennia, or a few dozen or a few hundred millennia; but this decision need only be made once. When even the last few men and women left holding out answer the call to the sublime, and choose to bear no more children—then that will be the species' finest hour. And so that will be the time to leave. The timetable of voluntarism is perfect: it provides ample time, but not a day too much of it.

Let this article be a hopeful obituary, then, for a race that may yet hurl its defiance into the teeth of the cosmos, and surpass itself as no earthly creature has ever done before. Let *Homo sapiens*' epitaph say that nothing in our career became us like the ending of it.

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