



Negative Population Growth **The NPG Forum**

Confronting The 21st Century's Hidden Crisis: Reducing Human Numbers by 80%

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My position is simply stated. Within the next half-century, it will be essential for the human species to have fully operational a flexibly designed, broadly equitable and internationally coordinated set of initiatives focussed on reducing the *then-current* world population by at least 80%. Given that even with the best of intentions it will take considerable time and exceptional diplomatic skill to develop and implement such an undertaking, perhaps on the order of 25 to 50 years, it is important that the process of consensus building — local, national and global — begin now. The mathematical inevitability that human numbers will continue their dramatic increase over the next two generations, to perhaps 10 billion by the year 2040, and the high probability that this numerical increase will exacerbate still further the systemic problems that already plague humanity (economic, political, environmental, social, moral, etc.), only reinforces this sense of urgency. There are, however, hopeful signs. In recent years, we have finally begun to come to terms with the fact that the consequences of the 20th century's rapid and seemingly uncontrolled population growth will soon place us — if it hasn't already done so — in the midst of the greatest crisis our species has yet encountered.

Some Realities

In order better to appreciate the scope and ramifications of this still partly hidden crisis, I shall briefly call attention to eight essential, incontrovertible and inescapable realities that must not only be fully understood but soon confronted.

First, during the present century world population will have grown from somewhere around 1.6 billion in 1900 to slightly more than six billion in the year 2000, an almost four-fold increase in but 100 years. This is an unprecedented numerical expansion. Throughout human history, world population growth measured over similar 100-year intervals has been virtually non-existent or at most modestly incremental; it has only become markedly exponential within the last few hundred years. To illustrate this on a more easily comprehensible scale, based on the present rate of increase of some 90 to 95 million *per year*, human population growth during the 1990s alone will amount to

nearly one billion, an astonishing 20% increase in but 10 years. Just by itself, this 10-year increase is equivalent to the *total* global population in the year 1800 (barely 200 years ago) and is approximately *triple* the estimated world population at the height of the Roman Empire (ca. 300 million). It is a chastening thought that even moderate to conservative demographic projections suggest that this billion-per-decade rate of increase will continue well into the next century, and that the current global total of 5.7 billion (1995 estimate) could easily reach 10 to 11 billion by the year 2050.

Second, even if a fully effective program of zero population growth were to be implemented immediately, by limiting human fertility to what demographers term the replacement rate (roughly 2.1 children per female), human population would nevertheless continue its rapid rate of expansion. In fact, demographers estimate that it would take at least two to three generations (50 to 75 years) at ZPG fertility levels just to reach a point of population stability,

unfortunately at numbers considerably higher than at present. This powerful population momentum results from the fact that an unusually high proportion (nearly 1/3) of the current world population is under the age of 15 and has not yet reproduced. Even more broad-based population profiles are to be found throughout the developing world, where the under-15 age cohort often exceeds 40% and where birth rates have remained high even as mortality rates have fallen. While there are some recent indications that fertility rates are beginning to decline, the current composite for the less-developed world (excluding China) is still nearly double — ca. 4.1 — that needed for ZPG.

Third, in addition to fertility levels, it is essential to understand that population growth is also significantly affected by changes in mortality rates. In fact, demographic transition theory predicts that the earlier stages of rapid population expansion are typically fueled more by significant reductions in death rates than by changes in birth rates. Nor does recent empirical data suggest that average human life expectancy has reached anywhere near its theoretical upper limit, in either the developing or developed worlds. Consequently, unless there appears a deadly pandemic, a devastating world war or a massive breakdown in public health (or a combination of all three), it is inevitable that ongoing global gains in human longevity will continue to make a major contribution to population expansion over the next half-century, regardless of whatever progress might be made in reducing fertility. A further consequence is the fact that populations will inevitably get "older", with mean ages in the 35 to 40 range and perhaps as many as 1/4 of their members over age 60, as both mortality and fertility rates decline and human numbers (hopefully) reach stable levels. Not surprisingly, these aging populations will develop their own unique set of problems to resolve, not the least of which might be understandable but misguided efforts to increase the size (and economic productivity) of younger age cohorts by encouraging higher fertility.

Fourth, it is important to recognize that the quantitative scale, geographic scope, escalating pace and functional interconnectedness of these impending demographic changes are of such a magnitude that there are few if any historical precedents to guide us. For example, at the current rate of increase of 250,000 people *per day* (more than 10,000 *per hour*), it is ludicrous to speak of there being any significant empty spaces left on earth to colonize, certainly when compared with but a century ago. And it is even more ridiculous to suggest that "off earth" (extraterrestrial) migration will somehow be sufficient to siphon away excess human population, in either the near or more distant future.

Fifth, given the data and observations presented thus far, it becomes increasingly apparent that the time span

available for implementing an effective program of population control may be quite limited, with a window of opportunity that may not extend much beyond the middle of the next century. While future population trends are notoriously difficult to predict with precision, dependent as they are on a broad range of factors, most middle-of-the-road demographic projections for the year 2040 — less than two generations from now — are in the 9 to 11 billion range, nearly double our present numbers (see point #1 above). Several observations might help to bring this "limited" time span into somewhat better perspective: 1) the year 2040 is as close to the present as the year 1950; 2) an infant born in 1995 will be but 45 years old in the year 2040; and 3) a young person entering the job market in the mid-1990s will just be reaching retirement age in the year 2040. By any reasonable standard of comparison, this is hardly the remote future.

Sixth, it is extremely important to come to terms with the fact that the earth's long term carrying capacity, in terms of resources broadly defined, is indeed *finite*, despite the continuing use of economic models predicated on seemingly unlimited growth and notwithstanding the high probability of continued scientific/technological progress. Some further terminological clarification may be useful. "Long-term" is most appropriately defined on the order of *several hundred years at least*; it emphatically does not mean the 5 to 10 year horizon typical of much economic forecasting or political prognostication. Over this much longer time span, it then becomes much more reasonable — perhaps even essential to human survival — to define a sustainable human population size in terms of *optimums* rather than maximums. ***In other words, what "could" be supported in the short term is not necessarily what "should" be humanity's goal over the longer term.*** As far as resources are concerned, whether these be characterized as renewable or non-renewable, it is clear that the era of inexpensive energy (derived from fossil fuels), adequate food supplies (whether plant or animal), readily available or easily extractable raw materials (from wood to minerals), plentiful fresh water and readily accessible "open space" is rapidly coming to a close, almost certainly within the next half-century. And finally, the consequences of future scientific/technological advances — whether in terms of energy production, technological efficiency, agricultural productivity or creation of alternative materials — are much more likely to be *incremental* than revolutionary, notwithstanding frequent and grandiose claims for the latter.

Seventh, it is becoming increasingly apparent that rhetoric about "sustainable growth" is at best a continuing exercise in economic self-deception and at worst a politically pernicious oxymoron. Almost certainly, working toward a "steady-state" sustainability is much more realistic

scientifically, more attainable economically and (perhaps) more prudent politically. Assertions that the earth "might" be able to support a population of 10, 15 or even 20 billion for an "indefinite" period of time at a standard of living "superior" to the present are not only demonstrably false but also cruelly misleading. Rather, ongoing analysis by ecologists, demographers and numerous others suggests that it is quite likely that the earth's true carrying capacity — defined here (simply) as humans in long-term adaptive balance with their ecological setting and resource base — *has already been exceeded by a factor of two or more*. To the best of my knowledge, there is no clear-cut or well-documented evidence that effectively contradicts this sober — even frightening — assessment. Consequently, since at some point in the not-too-distant future the negative consequences and ecological damage stemming from continued and uncontrolled human reproductive profligacy *could well become irreversible*, and because there is only one earth with which to experiment, it is undoubtedly better for our species to err on the side of prudence, exercising wherever possible a cautious and careful stewardship.

Eighth and finally, only about 20% of the current world population (ca. 1.2 billion people) could be said to have a "generally adequate" standard of living, defined here as something approximating that of industrialized Western Europe, Japan or North America, the so-called developed world. The other 80% (ca. 4.5 billion), incorporating most of the inhabitants of what have been termed the developing nations, live in conditions ranging from mild deprivation to severe deficiency. Despite well-intentioned efforts to the contrary, there is little evidence that this imbalance is going to decrease in any significant way, and a strong likelihood that it may get worse, particularly in view of the fact that more than 90% of all future population growth is projected to occur in these less-developed regions of the world. In fact, there is growing concern that when this burgeoning population growth in the developing world is combined with "excessive" per capita energy and resource consumption in much of the developed world, the potential for wide-spread environmental deterioration (systemic breakdown?) in a number of the earth's more heavily-stressed ecosystems becomes increasingly likely. This is particularly worrisome in regions already beset by short-sighted or counterproductive economic policies, chronic political instability and growing social unrest.

If the above "inescapable realities" are indeed valid, it is obvious that rational, equitable and attainable *population goals* will have to be established in the very near future. It is also obvious that these goals will have to address and in some fashion resolve a powerful internal conflict: how to create and sustain an adequate standard of living for *all* the world's peoples (minimizing the growing dis-

tance between rich and poor) while simultaneously not over-stressing (or exceeding) the earth's longer-term carrying capacity. *I submit that these goals cannot be reached, or this conflict resolved, unless and until world population is dramatically reduced — to no more than two billion people — over the next two or three centuries.*

The Central Argument Restated

On the assumption that the foregoing observations are indeed close to the mark, the logic underlying the above recommendation — and the statement that began this essay — seems both inexorable and clear. It deserves a brief reiteration.

Over the next several generations, and beginning as soon as possible, humanity must not only take significant steps to arrest the rapid growth of human population *but also begin to reduce it dramatically*. However, it will be very difficult if not impossible to stop current growth short of 9 to 10 billion. This is due not only to the momentum effect but also to the great difficulties, both diplomatic and temporal, in developing and implementing the necessary political, economic, scientific and moral consensus about both ends and means.

Because there is no clear-cut evidence to support assertions to the contrary, and precious little margin for error, it is only prudent to work from the increasingly legitimate assumption that the earth's long-term carrying capacity is no greater than two billion people. *It is therefore necessary to confront the inescapable fact that human numbers will have to be reduced by 80% or more, from the all-but-inevitable 9 to 11 billion in the mid-21st century to something approaching 2 billion by the end of the 22nd century, some 200 years from now.* Obviously, a numerical dislocation of this magnitude will require a massive re-orientation of human thought, expectations and values.

Just as obviously, time is short, with an implementation window that will last no more than the next 50 to 75 years, and perhaps less. This process of population stabilization and reduction should have begun a generation or more ago — say in 1960 when human numbers were "only" three billion and demographic momentum more easily arrested — and certainly cannot be delayed much longer. For it is abundantly clear that if we do not choose to address and resolve this problem ourselves, "nature" will almost certainly solve it for us, with consequences that would be at best unpredictable and at worst unimaginable.

The problem of establishing rational and defensible population "optimums" deserves further comment. Perhaps most surprising is how unusual it is to find individuals —

or organizations — who are willing to state publicly and emphatically that just reaching a point of “population stability” during the next century *will not be enough*, either to solve our near-term demographic difficulties or to stave off a future demographic catastrophe. For the latter scenario will almost surely come to pass if humanity naively and/or unquestioningly accepts global population levels that are set so high — in the 10 to 15 billion range — that they are clearly unsustainable over the longer term. One only has to consider the stresses already evident at the *current* level of nearly six billion to recognize that any sort of long-term stability at figures double that number will be impossible to accomplish. Put most simply, *there seems to be no credible alternative to the premise that a very significant population reduction must necessarily follow population stabilization.*

Admittedly, the above-mentioned global goal — a sustainable optimum of approximately 2 billion people by the beginning of the 23rd century — has a substantial inferential component. This “subjectivity” is undoubtedly due to a number of factors, among which might be included: 1) the fact that as yet only a modest amount of empirical scientific research has been directed toward establishing quantifiable (and testable) parameters for what the earth’s long-term carrying capacity might actually be; 2) the strong likelihood that the sheer complexity, multidisciplinary nature and sociopolitical “sensitivities” surrounding analysis of the population problem have not only inhibited scientific research and funding but have also elicited (in some) a sort of “scale paralysis”; 3) the obvious fact that the process involved in initially establishing — and subsequently implementing — future population goals will involve complex “qualitative considerations” that significantly transcend a strictly scientific (quantitative) analysis; 4) the presence of a persistent (and probably deep-seated) human “reticence” to give serious consideration to a demographic future that seems quite remote from one’s daily life and activities, not to mention a future for which there is little historical precedent; and 5) the distinct possibility that, even with the best of political intentions and unprecedented cooperation at all relevant levels, it may take considerably longer than 200 years to reach the desired demographic goals.

Notwithstanding these and other uncertainties, the two billion “global optimum” utilized here is quite consistent with estimates to be found in several of the sources listed at the end of this essay (see particularly the articles in the volume edited by Grant, the books by Hardin and the Ehrlichs, and various publications and position papers prepared by NPG). Actually, this two billion estimate may be somewhat on the generous side, particularly in light of the fact that some recent projections for the earth’s long-

term carrying capacity have been set much lower, in the one-half to one billion range (David Pimentel: pers. com.).

On the other hand, *even if* future research shows that this global carrying capacity figure has been *underestimated* by at least 1/2 — that is, if further analysis demonstrates that an optimum population estimate of two billion is “off-target” by a factor of two or more — the argument put forth here loses little if any of its validity or persuasive power. For example, if it is indeed inevitable that global population size is destined to reach 10 to 12 billion within the next half-century, even efforts to reach a somewhat “larger” optimum population — one (say) in the four to five billion range — would *still* require a very significant decrease in human numbers, roughly on the order of 60%. From a practical standpoint, this figure differs little from the 80% reduction postulated earlier; certainly, either of these “projections” is more than adequate to dramatize the need for a profound — and immediate — response to this looming demographic crisis.

Future Prospects

I am cautiously optimistic that this crisis can be averted, if only because all humans — despite our many differences — share a deep-rooted “investment in immortality”, an individual and collective concern for posterity. This powerful commitment to the future manifests itself biologically (through the children we beget), socioculturally (through our relationships with others) and morally (through our religious and/or ethical systems). As an essential first step, our species will soon have to establish a difficult but very necessary balance between individual reproductive rights and collective reproductive responsibilities. That is, all of the world’s peoples must come fully to terms with the fact that a person’s (biological) *right* to have children must be mediated by his or her (social) *responsibility* not to have too many. Certainly, any hope for success in this massive reorientation of basic biological propensities and strongly-held sociocultural expectations will require attention not only to quantitative but also to qualitative issues and concerns. In fact, it will likely be easier to elicit broad-scale agreement on the pressing need for a significant reduction in human numbers — the “quantitative dimension” — than it will be to foster a broad scale consensus on the “qualitative” restructuring of individual, political, economic, social and ethical perceptions that will also be necessary.

In pragmatic terms, the initial stabilization and subsequent 80% reduction in human numbers suggested earlier could be brought about with relative ease by establishing a worldwide average fertility rate of approximately 1.5 to 1.7 over the next several generations (lasting well into the 22nd century at least). Essentially, all that

would be necessary is for couples to "stop at two"; because some women have no children, and others only one, this would rather quickly result in an overall (sub-replacement) fertility rate in the desired range. It is important to note that rates approaching this 1.5 to 1.7 level have already been reached in a number of nation-states (including the U.S.), at least for limited periods of time, and further that these fertility levels have in most instances been attained voluntarily (without external coercion). Certainly an important early step in this process of population reduction would be to promote appropriate (i.e. culturally acceptable) *local incentives* to significantly postpone age at marriage and/or age at first pregnancy, from (say) the mid/late teens until at least the mid-20's. If these same incentives also encouraged increased intervals between births, the almost certain consequence would be markedly smaller family sizes coupled with a significant decrease in the number of generations per unit time (from nearly six generations per century to fewer than four). Once an optimum population size is within reach — perhaps toward the end of the 22nd century when global numbers begin to come into balance with carrying capacity as *then* understood — fertility rates could then be increased to the previously mentioned ZPG replacement level (ca. 2.1).

However, it is also abundantly clear, to judge by the agenda and controversies emanating from the recent (September 1994) United Nations-sponsored International Conference on Population and Development, that implementation of these greatly reduced fertility rates is inextricably intertwined with a number of very sensitive political and ideological concerns. Chief among these are matters pertaining to: the enhancement of gender equity; the educational and economic empowerment of women; ongoing controversies surrounding family planning, birth control and abortion; problems of development and modernization; differential access to resources and/or inequities in their distribution; various forms of pollution and environmental degradation; endemic poverty and implementation of effective public health measures; the growth of nationalism and ethnic/religious tensions; human migration and political/ecological refugees; etc.; etc. These are all very important issues, and there is little doubt that they are frequently interconnected in complex cause-and-effect relationships with population growth. However, it is even more important not to confuse short-term means with longer-term ends. More specifically, it is essential that humanity does not lose sight of the over-arching and exploding demographic "forest" in the midst of legitimate and deeply-felt concerns about particular political/ideological "trees".

For the stark reality is this. *Population regulation is the primary issue facing humanity; all other matters are subordinate.* Proponents of the above-mentioned

agenda items, at the United Nations and elsewhere, must become fully cognizant of the fact that solutions to the problems that deeply concern them will be far more likely (and lasting) in a world that is moving rapidly and effectively toward population stabilization and eventual population reduction. For it must be obvious that the alternative — a world inexorably expanding toward 12 to 15 billion people by the end of the next century — offers much less hope for successful resolution of these matters. Quite simply, hard-won gains would almost certainly be overwhelmed by continuing and uncontrolled numerical growth, similar to what can be observed even now in those regions of the world where populational doubling times of 25 to 35 years are the norm. In fact, to judge by the available evidence, it is entirely possible that the conventional wisdom of the past 50 years — particularly to the extent that this "wisdom" has been characterized by large-scale economic aid (transfers of wealth) and liberal immigration policies (transfers of people) — has done more to stimulate rapid population growth than inhibit it. It's almost as if a demographic Parkinson's Law were in effect, to wit: "Births tend to expand to fill the *perceived* socioeconomic space". In other words, when the *true limits* of this "perceived space" are *obscured at the local level* by overly generous international aid and relatively easy opportunities for emigration, the unfortunate demographic result has all too often been "counterproductive" incentive structures, creating reproductive contexts in which local fertility rates have generally tended to *increase* rather than diminish.

This leads to a crucial final point, the ineluctable fact that in our multi-national world solutions cannot be imposed from without. Ultimately, the people of each sovereign state must come to terms with, and subsequently resolve, their own local and unique demographic problems (hopefully motivated by a full awareness of global realities). In this regard, given the limited time available and the excruciatingly difficult decisions that must be made, it is daunting to realize that population problems are often the most pronounced in areas of the world where national sovereignty — and the requisite political, economic and social stability — is most tenuous.

Because of these difficulties, it remains to be seen whether humanity will be capable of mounting a unified and lasting effort toward population control. For surely this is an undertaking that has no quantitative nor qualitative precedent, an effort that must be conducted on a species-wide scale, and an endeavor that by its very nature must be sustained for a century or more. While posterity demands that we be successful, I am only cautiously optimistic that such success can be achieved by rational human forethought, or by means compatible with contemporary social, political and ethical norms.

A NOTE ABOUT SOURCES

This hortatory essay — written and revised during the period November 1994 to May 1995 — hopefully captures the essence of a demographic perspective I have been developing over the past two decades in my introductory biological anthropology course here at Kenyon College. My primary goal was to provide a clearly-stated and reasonably jargon-free “position paper” for my undergraduate students to think about, react to, and perhaps improve upon. For my part, I have gathered ideas and utilized data from a number of sources. The following are the most important.

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