Global War and the Human Population Problem

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The author examines the likelihood that global war, utilizing nuclear or other weapons of mass destruction, will halt the ongoing destruction of Earth's biosphere by human overpopulation and industrial activity. After summarizing the current state of the global environment, he speculates on what will happen if present trends continue and then examines the possible impact of such a war as a natural counterbalance to human destruction of the biosphere. He concludes by addressing the question of the size and composition of a sustainable human population.

Key Words: Ecology, biosphere, world overpopulation, migration, endangered species, weapons of mass destruction, global war.

The current threat to life in the biosphere is of overwhelming dimensions.[1] The planet is currently experiencing the greatest mass extinction of species since the time of the dinosaurs, 65 million years ago, and it is being caused solely by mankind's massive numbers and industrial activity.[2] Most of the species extinction is being caused by rampant destruction of wildlife habitat, such as forests and wetlands. In other cases, species are being deliberately singled out for destruction, as in the case of rhinoceros horn (for Yemeni dagger handles), or tigers and leopards (for traditional medicine in China, Japan, and other East Asian countries), or whales (for Japanese whale-meat shops).

Apart from causing the extinction of thousands of other species by depriving these life forms of their natural habitat, mankind's

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[1] This article synopsizes the book, *Can America Survive?* (Reference 1), an on-line version of which is available at the Internet web site http://www.foundation.bw . That book contains detailed discussion of the concepts discussed here, and an extensive bibliography. The primary data source for the points made in this article is the World Bank's World Development Indicators CD-ROM. Other data sources are cited in *Can America Survive?*

[2] See *The Sixth Extinction: Patterns of Life and the Future of Humankind*, by Richard E. Leakey and Roger Lewin, Anchor Books / Doubleday, 1996; also "The Sixth Extinction," *National Geographic*, February 1999.

increasing numbers and industrial activity are causing such great changes to the atmosphere that numbers of concerned scholars are today warning that it is conceivable that all advanced forms of life on the planet's surface could be extinguished in a relatively short time.[3] Industrial gasses are poisoning the atmosphere to such an extent that the ozone layer that protects all biological life from extreme radiation is being destroyed. These gasses are contributing to global warming. Signs of global warming are dramatic and ubiquitous.[4] And as the masses of Asia increase in number and industrialize, the rate of ecological damage is rising rapidly.

Without denying the possibility that the ongoing explosion of the human population, exacerbated by increasing industrial activity, may result in the catastrophic destruction of the planet's biosphere, it has to be admitted that the human species is at the very least causing a tremendous and irreversible changes in global biodiversity. Of the 5-30 million species on the planet's surface, an estimated 30,000 are currently being exterminated every year. With each passing year the world becomes a less and less varied and interesting place to be. Mankind is in the process of destroying, in an instant of evolutionary time, the global environment in which it evolved and on which it depends.

At the very least, human overpopulation and increasing industrial activity are causing the extinction of large numbers of other species, and could potentially lead to the biological death of the planet. This destruction began with the advent of modern technology several centuries ago, and accelerated tremendously with the advent of the petroleum age. The human population continues to grow by about 1.3 percent a year, and economic activity (industrial production) is increasing by about three percent per year. With ecologically diverse forests being destroyed at the rate of 16 million hectares per year, the pace of destruction is relentless.

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[3] For details on the current state of the world, refer to the annual Worldwatch Institute publication, *State of the World*, or the World Resources Institute's annual publication, *World Resources*.

[4] See the web site http://www.climatehotmap.org for a description of the global-warming picture (also reported in "Greenhouse Effects," *Time*, December 13, 1999). See also http://scian.com/explorations/2000/041700warmocean ("The Heat is On," by Sarah Simpson, Scientific American) and http://www.vision.net.au/~daly ("Still Waiting for Greenhouse" by John L Daly).

Current Trends, and What Will Happen if They Continue

The world total human population is exploding. In 1999 it passed the six billion mark, and it increases by about 80 million every year. It will continue to do so not just because birth rates in many areas are far above the "replacement" level of 2.1 children per female in her lifetime, but also because of population "momentum" (the continued growth of a population at replacement-level fertility because previous generations of higher fertility have not yet had all of their children). Birth rates have fallen throughout the developed world and in developing nations, but very slowly among the latter and rarely to replacement level. Population continues to increase in many developing countries despite below-replacement fertility levels, because of immigration. Current estimates by the United Nations and the World Bank indicate that the world population will continue to increase for decades, even if human birth rates were to drop rapidly to replacement level everywhere. Under the most optimistic assumptions about fertility decline, the human population will increase by another fifty percent in the foreseeable future – to some nine billion people. If birth rates do not drop to replacement level, the population will continue to soar to ever-higher levels.

History offers no cause for optimism that the human population explosion will spare any portion of the world. Underdeveloped nations continue to grow in population until they simply run out of natural resources and cause total destruction of their forests and wildlife. The overpopulated regions then seek to export their excess population to the more developed industrial nations, where, as a result, population currently continues grow at about one-half of one percent per year. Everywhere, it seems, mankind is striving for maximum economic growth, regardless of consequences to the local environment or to the planet's ecological well-being.

The world's forests, in which many of the current plant and animal species reside, are being destroyed as a direct result of the expanding human population. The destruction of the forests is currently the prime cause of much of the ongoing species extinction. Around 94 percent of the forest that existed just sixty years ago, circa 1940, has already been destroyed (60 billion hectares then, 3.6 billion now). In the past 20 years, forests have disappeared altogether in 25 countries.[5] At these rates, most of Earth's natural forest cover will soon be gone. As human population continues to increase, the demand for land and aged timber will increase, so that the destruction of the shrinking forests will accelerate.

From the point of view of the exploitation of the world's natural resources, the U.S. population is the most destructive nation on Earth, since its industrial activity is the largest. Its population is large and its industrial production per person is one of the highest in the world. Its per capita commercial energy consumption is one of the highest in the world. Although birth rates in the U.S. fell to replacement level years ago, U.S. population growth now soars by about three million a year, due mainly to immigration and the higher birth rates of recent immigrants. For each new immigrant added to the country, about an acre of land is taken permanently out of wildlife habitat or agricultural production.

Despite the damage that its growing population and industrial activity are causing to the planet's environment and its own natural resources, the U.S. has no plans to reduce its per capita energy consumption, to reduce its industrial production per capita, or to reduce its population. Its policy, quite the contrary, is to increase both the population and the per capita industrial production, as rapidly as possible, regardless of the consequences to the planet's biosphere. As global population size, industrial production, and consumption rise, an ever-greater pressure is placed on the environment, polluting the planet's biosphere and driving more species into extinction as their natural habitat is polluted or literally taken away from them.

All nations of the Earth strive for increased economic and industrial activity. While we have pointed to the impact of the U.S., it is equally serious to note that China, the Indian sub-continent and southeast Asia, with far larger populations (together amounting to more than half of the world's total population) are industrializing rapidly, and have already caused vast ecological destruction and widespread pollution within their own regions.

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[5] Data from World Commission on Forests and Sustainable Development (also reported in "A Non-Fuzzy Earth Day" by Pranay Gupte, *Time*, May 3, 1999). See also *FAO Yearbook: Production* (annual), Food and Agricultural Organization of the United Nations, Rome, Italy, for detailed land-use data.

Perhaps the simplest readily available measure of industrial activity is the amount of commercial energy consumed, which is usually measured in terms of kilograms of oil equivalent (kgoe). Over the past few decades, the commercial energy consumption of the planet has increased at an average rate of about three percent a year, somewhat less in recent years. Note that this is about the same as the rate of increase of economic activity as measured by the standard measure, gross domestic product (GDP). Without energy, there is no industrial activity.

At the present time, about one-sixth of the planet's population has a high level of industrial production, and the rest of the population is striving to achieve high levels also. What this means is that, in the absence of war or other phenomena to reduce industrial activity, the level of industrial production will continue to increase even if the human population tapers off. The annual GNP per capita of the richest nations is on the order of about $25,000 (GNP per capita, purchasing power parity (PPP) current international dollars), whereas for poor countries it is about $2,000 per year. The world average is about $6,000. At a growth rate (in industrial production) of three percent a year, it would take the rest of the world about fifty years to catch up to where the developed countries are today. This means that even if the human population were to level off by 2050, global industrial production would continue to increase throughout this period, even if the developed nations "stood still" and the poorer nations just tried to catch up. Given the commitment of all nations to the increased standards of living associated with increased industrial production, global industrial production is bound to continue to soar as poor countries strive to become rich. Under the current world order, industrial production will continue to soar to higher and higher levels, and the massive destruction of the environment that is caused by industrial activity is likely to intensify.

In summary, even under the wildest assumptions about decreasing fertility rates, human population levels will continue to rise, and industrial activity will soar exponentially, for generations to come. The destruction to the biosphere will continue unabated. The planet's biosphere and biodiversity – already reeling from mankind's assault – are doomed.

Unless events impose a radical change upon humanity.

Disease, Drought, Starvation, War and Man-made Weapons of Mass Destruction

We continually see the impact of disease, drought, starvation, natural disasters and warfare on human populations in the most overcrowded areas. Ethiopia is entrenched in war against Eritrea while hundreds of thousands of its members face drought, starvation and warfare. Africa is seeing the spread of HIV infection. But so far these "horsemen of the apocalypse" are having no effect from the point of view of halting the human global population explosion and the resultant destruction of the planet's environment. What can stave off impending disaster? What can halt the rapid destruction of the world's forests, atmosphere, oceans, and species?

A large asteroid might hit the planet, as is believed to have occurred 65 million years ago, but this is unlikely to happen within the near future. Disease and famine could wipe out large numbers of human beings in an overpopulated world, but the more advanced nations are struggling to ensure that this does not happen, and that the disastrous global population explosion continues unabated. It is clear that HIV/AIDS will not stop the population explosion – it is not even stopping it in Africa, where in places prevalence rates reach twenty-five percent, although a real killer plague could certainly wipe out vast swathes of mankind.

And war? Small wars, such as the scores of small conflicts that continue year after year, are no match for the ongoing population explosion, especially as the average age of the population continues to decline and the percentage of the population of reproductive age increases each year. Not even major wars, such as the First and Second World Wars, have had a long-term impact on the growth of the human population. But a really big war, involving thousands of nuclear or other weapons of mass destruction could make a real difference. Such a war could destroy huge numbers of people and bring an immediate halt to the large-scale industrial activity that is causing so much environmental degeneration. It could reduce human numbers to the point where they no longer have a significant impact on the planet's ecology. Many species other than man would also be adversely affected, but in many cases they are doomed to eventual extinction by human industrial activity even in the absence of such warfare. Nuclear proliferation *is* taking place, as also the proliferation of chemical and biological weapons. No matter how hard the U.S. strives to prevent it, as population pressures exacerbate political tensions, a future war employing unprecedented quantities of weapons of mass destruction seems virtually assured at some time in the twenty-first century.

An attack involving 1,000 nuclear bombs can destroy about three quarters of the total urban population of the world, and an attack using 1,000 such weapons is of modest size. One thousand nuclear bombs could be produced, for example, with just the amount of plutonium that the nuclear powers have lost track of. At the present time, the U.S. possesses about 12,000 nuclear warheads and the former states of the USSR possess 22,500, of which about 7,000 on each side are classified as "strategic." Under the START II arms reduction treaty, the number of strategic nuclear weapons would be halved, to about 3,500 deployable warheads each for the US and Russia by the end of 2007. Either of these stockpiles is sufficient to destroy all 3,385 cities with a population of 100,000 people or more. Meanwhile, China is rapidly building its own arsenal, and other countries such as Israel, India, Pakistan and North Korea are following suit.[6]

Scenario for the Post-Nuclear War Age

It would appear that catastrophic nuclear-age war is inevitable, for several reasons. A major factor is the "politics of envy" – the desire for the "have-nots" of the world to destroy what the "haves" have, even if it does not improve their situation. The gap between the industrialized "West" and the rest of the world is widening, and the hatred and envy are growing as the poorer nations realize that they will never catch up. With the proliferation of plutonium from nuclear reactors, terrorists and rogue nations will soon have the capability to produce thousands of suitcase-sized nuclear bombs, and deliver them to any cities in the world. No missiles or airplanes are required. In terms of feasibility, likelihood, and effectiveness, global nuclear war or some other form of conflict utilizing weapons of mass destruction appears to "dominate" all other likely solutions to human overpopulation and man-made ecological destruction.

[6] For detailed information on nuclear weapon stockpiles, refer to the Internet web sites http://www.cdi.org (Center for Defense Information) and http://www.nrdc.org (Natural Resources Defense Council).

Given the apparent inevitability of global nuclear war, the issue must be addressed: what preparations should be made for it. The following are proposed. First, make preparations such that if and when global nuclear war does occur, it will be possible to establish a sustainable population. Second, assemble a collection of all of the world's knowledge. Replicate the collection and store it in various hidden locations around the world, to minimize the chance of its extinction. Third, take steps to preserve the planet's biodiversity, such as storing seeds in many secret locations[7] and establishing ecologically viable safe zones (large reserves) of sufficient size to ensure the survival of the world's disappearing larger species. Protection of plant genetic material (seeds) and small animals appears feasible, but the options for saving large species (e.g., apes, tigers, rhinoceros) from extinction are limited in the current economics-driven world.

Sustainable Human Population Size

Assuming that some human beings survive the apocalypse, it is of interest to address the question of how large a human population is likely to be sustainable. Over the years, a fair amount of effort has been invested in trying to determine an "optimal" human population size for Earth. *In Can America Survive?* I suggest that an industrial society of five million people and a primitive rural (hunter-gatherer) population of five million may be sustainable. Very briefly, the rationale for these numbers is as follows.

For millions of years, Earth supported a hunter-gatherer hominid population estimated to be about five million in size. That size and type of population is the only one that has proved sustainable in the long term. When agriculture was developed, the planet was able to support 300 million to 500 million people. Careful analysis (Reference 5)[8] shows that 500 million people is about all that can be supported by solar energy – today's population of six billion was achieved because of the use of fossil fuels, which will soon

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[7] See "Time Travelers on Ice" by Helen Gibson Ardingly in *Time*, January 17, 2000 for an article on Kew Gardens' new seed bank.

[8] See also, "Natural Resources and an Optimum Human Population" by David Pimentel et al., *Population and Environment: A Journal of Interdisciplinary Studies*, Vol. 15, No. 5, May 1994, Human Sciences Press, Inc.

be depleted (oil and natural gas within 50 years, coal somewhat later).

In Reference 1, an "optimal" human population is defined as the *smallest* population that can be maintained for a long period of time. The objective is to reduce the planetary impact of mankind to the lowest level possible, while at the same time keeping the human numbers sufficiently high and dispersed to reduce the likelihood of extinction to a low level. I visualize (see Reference 1) a sustainable global population comprised of two parts – a single industrially advanced nation of five million and a rural hunter-gatherer population of five million, dispersed over the Earth. The rationale for specifying a size of five million for the industrial population is that, because industrial populations consume about 100 times as much energy as nonindustrial populations, that number is all that the solar energy budget of the planet can support.[9]

The purpose of the widely spread rural population is to reduce the chance of human extinction from a cataclysmic event that might exterminate a geographically concentrated industrial population. The role of the single-nation industrial population is to protect the rural population and regulate the size of the global population.

The approach based on Reference 1 to determining an "optimal" human population size and character is quite different from approaches proposed earlier. Previous approaches attempted to *maximize* the number of human beings on the planet, and mainly ignored the dangers of large human populations to the planet's ecology and environment. The proposed approach views that it is the

[9] Recall that the planet can support at most 500 million people on solar energy at a very low-energy level of living. High-technology (industrial) man utilizes about 100 times as much energy as low-technology (hunter-gatherer) man. (People in advanced industrial nations consume about 2,500 – 8,000 kilograms of oil equivalent (kgoe) per capita per annum of commercial energy. People in poor nations consume as little as one-hundredth of that amount.) Hence the planet's solar energy "budget" can support 500 million low-energy-consuming human beings, or 5 million high-energy-consuming human beings, or any mix that satisfies the equation: number of low-energy-consuming people + 100(number of high-energy-consuming people) = 500 million.

Historically, the planet's biosphere experienced little stress from a hunter-gatherer population of 5 million, so let us assume a global hunter-gatherer population of size equal to that number. In this case, the number of industrial (high-energy-consuming) people that can also be supported by solar energy is: (500 million – 5 million)/100 = 4.95 million, or 5 million.

planet's resources (land, water, solar energy, biosphere), not mankind, that determines the maximal size of human population, and that mankind will survive in the long term only if it makes minimal impact on the biosphere. The issue then is to determine a human population size and character that has a negligible impact on the biosphere, while at the same time is sufficiently large and of a character that it has a high chance of long-term survival. Under this approach, the objective is to determine the *minimal*-sized human population that has a good chance of long-term survival. Based on experience to date, the previous approach of attempting to maximize the size of the human population, with the concomitant macroscopic changes that this causes to the ecology and environment of the biosphere, is a prescription for disaster.

With respect to establishing a sustainable population, it would appear that time is of the essence. The longer the passage of time before mankind establishes a sustainable population (i.e., one that exists in harmony (equilibrium) with the rest of the biosphere), the less there is to save. With each passing year under mankind's current global industrial regime, more species are extinguished and the diversity of the biosphere decreases. Eventually, mankind will establish a sustainable population (whether by choice or by force of nature), or it will cease to exist. If it survives for the long term, the only real outstanding issue is what kind of world it will inhabit – one with an abundant variety of life that evolved over millions of years, or one that is sadly deprived of many of its interesting, and possibly necessary, species.

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BOOK REVIEWS

Cultural Amnesia: America's Future and the Crisis of Memory
Stephen Bertman
Praeger Publishers, 2000

The six Regents universities in Kansas host a summer academy for the top high school graduates before they go on to college. It rotates among the universities, and comes to Wichita State University, where this reviewer teaches, every six years.

During the summer three years ago, I was invited to be one of the academy's speakers in a panel on "Racism in America." In my opening talk, I sought to place the racial experience of the United States into historical context. My message essentially was that the presence of slavery, brought in by the slave trade, had run counter to the central *ethos* of American sensibility, which was powerfully oriented toward the Enlightenment. It was Britain, with its navy, that abolished the slave trade, responding also to the classical liberalism that predominated in its thinking. It wasn't long before slavery itself was abolished. The century and a third since that time has not been easy, but has marked the efforts of a society, again moved predominantly by humane instincts, to grapple with difficult human issues.

My remarks were followed by those of a vivacious, highly articulate "black activist." She excoriated virtually everything about "a racist United States," and was eloquent in her complaints of "victimization." She was followed by a black state senator, who mildly seconded her point of view and devoted most of his attention to refuting mine. The fourth panelist was a conservative from Pakistan who did a much more effective job than I did of countering the charges of American "racism."

During the question and discussion period, the response by the thirty or so students present was revealing. Unanimously, they were vehement in support of the activist's attacks on the United States; and no one voiced any sympathy whatsoever with the perspective I had presented. The three or four black students among them were asked by the activist whether they thought of themselves primarily as