EDITORIAL

APOCALYPSE WHEN?

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The Revelation of St. John the Divine (the last book in the New Testament of the Christian Bible), otherwise known as the Apocalypse, gives a dire forecast of what will happen to us on the Day of Judgment. To the casual reader, the predicted doom and gloom for those on Earth who did not meet the mark may seem like the ravings of a religious mystic. Yet, the predictions, especially the appearance of the Four Horsemen, have a curiously uncomfortable ring when applied to our world today.

Certain things may be largely out of our control, even if we really care about the future of our species. Current astronomical research suggests there is a 1:5000 chance that there will be an extinction due to an asteroid of more than a kilometer in diameter colliding with the Earth just before the end of this century—an event that could wipe out humankind, or at least civilization as we know it.[1] This catastrophe will be faced by our great grandchildren, but how to plan for it is the responsibility of their forebears—namely us!

Humankind is already on a pathway of self-destruction, an achievement that will not need the aid of an aberrant asteroid. A Nobel laureate debate held in Stockholm just over a decade ago tackled the question, "What is the greatest problem we face?" With almost unanimity (notably Mother Teresa dissenting), the answer was "overpopulation." Humankind is in its last doubling, and if the population growth is not controlled, humans will cease to exist. Of course, most people regard the bearing of children as a right and are sorely troubled when any government (eg, the Republic of China) is bold enough to try to limit family size.

Critical care came into its own in 1952 with the development of the intensive care unit (ICU).[2,3] Since then, the world's population has risen from 2.8 to 6.1 billion.[4] The expectation was that the rate of growth would begin to slow in the next 2 to 3 decades, as resources would no longer support the expanding population. The ominous reality is that a decline in population growth rates has already started.

Model of Population Dynamics

The simplest and easiest model of population dynamics is based on the behavior of bacteria in a bottle of nutrient broth. The bottle represents a finite environment. When a bacterium is introduced into a culture medium, the actual number of bacteria is not very large after each division, so there is plenty of room for more bacterial growth. This is called the "lag" phase. Within a few generations, as the doubling effect of every generation becomes apparent, the culture medium becomes crammed with bacteria. This is the "logarithmic" phase. For a short time, the population remains static, as some bacteria die and division is slowed due to lack of nutrients. This is the "plateau." As the nutrients are finally used up, the bacteria die or cease to be active, and finally there are no active bacteria left in the culture. This is the "decline."

How can this model be related to humans in the environment in which we live? Estimates for the arrival of humans on Earth are relatively recent. The original Eve probably existed between 35 000 and 70 000 years ago, and it took from then to around 1900 for there to be 1 billion people. An increase was also kept from escalating by a high infant mortality rate and a relatively low life expectancy; a century ago, however, that began to change and population growth took off.

The human population of the world is not as homogeneous as a culture medium full of bacteria, so it may well turn out that the decline will have regional variation. Also, with the insight of human intelligence, man has the potential to voluntarily control birth rate. This has indeed happened in certain areas (eg, Germany) where people wishing to enjoy a high standard of living have maintained their resources by reducing the number of children to well below the number required for replacement.

We, in the United States, are concerned about the baby boomers reaching retirement, a time of life when the incidence of expensive diseases tends to increase. The maintenance of critical care, as we would wish it, is slipping from our grasp, as the competition for resources is becoming more intense. Despite the moment to moment vagaries in the professional job market, the numbers of nursing personnel are declining. Now, recruitment campaigns are trying to lure nurses from abroad to make up the shortfall in countries such as Britain and the Philippines. (Currently, Britain is conducting a large campaign in Spain to recruit doctors and nurses.)

The magnitude of our baby-boomer problems is dwarfed by such countries as India, whose runaway population nearly doubled to more than 1 billion people in just over 15 years. In 20 to 30 years, the number of people older than 60 years is predicted to be larger than the current population of the whole of North America. The majority of people living in India today are either older than 60 or younger than 15. Curative health services are inadequate, literacy runs at less that 50%, and large numbers of children are illegally in the work force to the extent that their ability to obtain an adequate education is nil. The population is maintained by a basic public health infrastructure. In one exceptional state (Kerala), where there has been a strong centuries-old tradition of education, the standards are much higher. There is some antipathy from the rest of India, because Kerala has had a strong Communist government.

The Four Horsemen of the Apocalypse

The Four Horsemen of the Apocalypse—war, pestilence, hunger, and death—are among us. People are fighting and killing each other, and starvation and disease have begun to cause an uncontrolled slowing of the rate of increase in world population. Regionally, some peoples are actually decreasing in number. Parts of central Africa epitomize this decline. AIDS has almost wiped out a generation. The more desert regions of Ethiopia and the Sudan and eastern Nigeria (Biafra) have seen starvation used as a weapon of war to kill dissident or politically unwanted groups. In Burundi, 2 ethnically similar tribes have tried to massacre each other, killing many thousands, while the rest of the world seemed to look the other way. People fleeing from these ghastly events have created massive refugee problems. The horrors of the Balkans and East Timor, and possibly the unveiling of massive terrorist acts in the United States, may well be occurring because of the unequal distribution of space and resources and particularly the uncomfortable knowledge that we are running out of both.

Our free-for-all society promotes the value of the financial bottom line rather than the value of life itself, except for the value of the lives of those with power and money. When the United States Senate held hearings on smoking in the late 1980s, 8 of the world's top tobacco executives refused to admit that smoking was a dangerous practice, yet only 1 of them admitted to smoking. Communities have been suppressed and despoiled to maintain the flow of oil from Port Harcourt in Nigeria. The oil industry has its champions at the very top of our government, so there is little wonder why a real conservation effort that would decrease our utilization of petroleum products is lacking. These same champions expect, and will have, the best quality of critical care in the world available to them in their time of need.

Conserving Critical Care Resources

The Department of Agriculture is promoting a farmer-friendly diet over a healthier one. Of course, the idea of conserving critical care resources by maintaining a healthier lifestyle may initially seem like an unobtainable goal, especially in an economy that depends on consumerism. In some areas, the stereotypical future intensive care patient is overweight, guzzling hamburgers and gasoline in a sport-utility vehicle, and feels that legs will always be needed for breaking and accelerating, rather than as a primary means of locomotion. The idea of cutting down on utilization of intensive care service by having a healthier population is too long term and radical for most of us to contemplate. As we are dealing with an aging population, with a large quantity of disease attributable to an unnecessarily and avoidably poor lifestyle, the need for change is obvious. The motivation for those we elect into authority to promote vital changes is low, as it would cut across too many political and business interests. In addition, the beneficial results of a sound health policy are unlikely to show up until long after most politicians have left office. The world's population explosion was initiated not by any great medical breakthrough, but by better quality living conditions and access to food, which resulted from a politically motivated desire to improve the well-being of the less fortunate members of society. Changes are possible.

Humankind is probably the first species on Earth to have the knowledge and means to prevent extinction by controlling the use of resources and conserving the environment. Those in control have the short-term goal to remain in control, even at the expense of others and the world we all are scheduled to live in. Education is the key to a future for humankind, especially for a healthier humankind with a suitable replacement rate. A healthy longevity is not out

of reach and should be the aim of all of us.[5] It will help cut down on utilization of intensive care service. If more emphasis were placed on worldwide literacy, many people would not need to rely on others to interpret the written word for them, and they would be empowered with the knowledge to make their own decisions. This will lead to motivation for population self-control and a healthier environment.

The Earth is considered by some to be a self-regulating organism (the Gaia hypothesis).[6] When the environment is unduly stressed, the Earth responds by means, such as extinction, to remove the stress and to regulate the environment so that it can best support life. Our diminishing resources may well be part of this process. Unless healthcare promotes a healthier way of living to prevent disease, we will continue to have problems in providing enough curative care.

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