Dr. Garrett Hardin, Professor Emeritus of Human Ecology at the University of Southern California (Santa Barbara), has made important contributions to our thinking about population by bringing together ethics and biology. His ground-breaking 1968 essay, "The Tragedy of the Commons" was reprinted in the inaugural issue of The Social Contract. *This article was a guest essay in* Environmental Science: Sustaining the Earth *(Wadsworth, 1991) by G. Tyler Miller.*

CARRYING CAPACITY AND QUALITY OF LIFE

By Garrett Hardin

A competent physicist has placed the human carrying capacity of the globe at 50 billion—about 10 times the present world population. Before you are tempted to urge women to have more babies, consider what Robert Malthus said nearly 200 years ago: "There should be no more people in a country than could enjoy daily a glass of wine and piece of beef for dinner."

A diet of grain or bread is symbolic of minimum living standards; wine and beef are symbolic of all forms of higher living standards that make greater demands on the environment. When land used for the direct production of plants for human consumption is converted to growing crops for wine or corn for cattle, fewer calories get to the human population. Since carrying capacity is defined as the *maximum* number of animals (humans) an area can support, using part of the area to support such cultural luxuries as wine and beef reduces the carrying capacity. This reduced carrying capacity is called the *cultural carrying capacity*. Cultural carrying capacity is always less than simple carrying capacity.

Energy is the common coin in which all competing demands on the environment can be measured. Energy saved by giving up a luxury can be used to produce more bread and support more people. We could increase the simple carrying capacity of the earth by giving up any (or all) of the following "luxuries": street lighting; vacations; most private cars; air conditioning; and artistic performances of all sorts--drama, dancing, music, and lectures. Since the heating of buildings is not as efficient as multiple layers of clothing, space heating would be forbidden.

Is that all? By no means: to come closer to home, look at this book [*Environmental Science*]. The production and distribution of such an expensive treatise consume a great deal of energy. In fact, the energy bill for the whole of higher education is very high (which is one reason tuition costs so much). By giving up all education beyond the eighth grade, we could free enough energy to sustain millions more human lives.

"We can maximize the number of human beings living at the lowest possible level of comfort, or we can try to optimize the quality of life for a much smaller population."

At this point a skeptic might well ask: "Does God give a prize for maximum population?" From this brief analysis we can see that there are two choices. We can maximize the number of human beings living at the lowest possible level of comfort, or we can try to optimize the quality of life for a much smaller population.

What is the carrying capacity of the earth? is a scientific question. Scientifically, it may be possible to support 50 billion people at a "bread" level. But is this what we want? What is the cultural carrying capacity? requires that we debate questions of value, about which opinions differ.

An even greater difficulty must be faced. So far we have been treating the capacity question as a *global* question, as if there were a global sovereignty to enforce a solution on all people. But there is no global sovereignty ("one world"), nor is there any prospect of one in the foreseeable future. We must make do with nearly 200 national sovereignties. That means, as concerns the capacity problem, we must ask how nations are to coexist in a finite global environment if different sovereignties adopt different standards of living.

Consider a redwood forest. It produces no human food. Protected in a park, the trees do not even produce lumber for houses. Since people have to travel long distances to visit it, the forest is a net loss in the national energy budget. But those who are fortunate enough to wander quietly through the cathedral-like aisles of soaring trees report that the forest does something precious for the human spirit.

Now comes an appeal from a distant land where millions are starving because their population has overshot the carrying capacity. We are asked to save lives by sending food. So long as we have surpluses we

may safely indulge in the pleasure of philanthropy. But the typical population in such poor countries increases by 2.1 percent a year—*or more*; that is, the country's population doubles every 33 years—or *less*. After we have run out of our surpluses, then what?

"...there has been overwhelming negative reaction to all proposals to make international philanthropy conditional upon the stopping of population growth..."

A spokesperson for the needy makes a proposal: "If you would only cut down your redwood forests, you could use the lumber to build houses and then grow potatoes on the land, shipping the food to us. Since we are all passengers together on Spaceship Earth, are you not duty bound to do so? Which is more precious, trees or human beings?"

The last question may sound ethically compelling, but let's look at the consequences of assigning a preemptive and supreme value to human lives. There are at least 2 billion people in the world who are poorer than the 32 million legally "poor" in America, and they are increasing by about 40 million per year. Unless this increase is brought to a halt, sharing food and energy on the basis of need would require the sacrifice of one amenity after another in rich countries. The final result of sharing would be complete poverty everywhere on the face of the earth to maintain the earth's simple carrying capacity. Is that the best humanity can do?

To date, there has been overwhelming negative reaction to all proposals to make international philanthropy conditional upon the stopping of population growth by the poor, overpopulated recipient nations. Foreign aid is governed by two apparently inflexible assumptions:

- The right to produce children is a universal, irrevocable right of every nation, no matter how hard it presses against the carrying capacity of its territory.
- When lives are in danger, the moral obligation of rich countries to save human lives is absolute and undeniable.

Considered separately each of these two well-meaning doctrines might be defended; together they constitute a fatal recipe. If humanity gives maximum carrying capacity questions precedence over problems of cultural carrying capacity, the result will be universal poverty and environmental ruin. The moral is a simple ecological commandment: *Thou shalt not transgress the carrying capacity.*

Or do you see an escape from the harsh dilemma?

* * * *