On the Equity of a Synarchic Minimal-Regret Population

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1. Background

In earlier writings, I have proposed a synarchic minimal-regret population of ten million as a feasible basis for planetary management of Earth. A "minimal-regret" population is one for which the likelihood of extinction from human causes is low for both the human species and for the other species of the biosphere. The minimal-regret population proposed in *Can America Survive?* consists of two components: a single-nation (city-state, planetary management organization) high-technology population of five million and a low-technology population of hunter-gatherers distributed over the planet. The purpose of the high-technology population is to maintain the planetary population at a level of about ten million by preventing industrial development anywhere on the planet except within the city-state. The purpose of the low-technology population is to reduce the likelihood of human-species extinction from a local catastrophe or pandemic disease.

The size of ten million people was arrived at by the following chain of reasoning. First, the planet Earth was able to support a hunter-gatherer population of 5-20 million people for millions of years, with no significant damage caused to the biosphere by the human population. Second, since the dawn of agriculture about 10,000 years ago, the planet was able to support a human population of about 200-500 million low-energy-consuming people (e.g., nomadic herders, agricultural peasant-farmers, very few and very low-energy-consuming city dwellers) with relatively little damage to the biosphere (extermination of a number of species of large animals, such as mastodons, but not of tens of thousands of species per year, as is being done today). Third, a high-technology person consumes about 100 times as much human-controlled ("commercial," or "manufactured") energy as a low-technology person (this figure is obtained, e.g., by comparing per-capita energy utilizations of people in very poor countries vs. those in very industrialized countries). In view of these observations, it is posited that if we limit the total planetary utilization of human-controlled energy to the level that "worked" to maintain planetary biological diversity for thousands of years, then we have a chance to achieve long-term sustainability of the biosphere. It is desired, then, that the total manufactured-energy consumption of the human population (both the high-technology (high-energy-consuming) and the low-technology (low-energy-consuming) components, combined) should be comparable to that level. Let us denote this level by E.

The determination of a long-term-sustainable population for Earth depends very much on the level of living of the population. From archaeological and historical evidence, we have knowledge of what sizes and types of populations can and cannot be supported. The planet was able to support 2-20 million hunter-gatherers for millions of years without damage to the biosphere. It was able to support 200-500 million low-technology people (primitive agriculturalists, nomadic herders, and a small number of primitive urban dwellers) for ten thousand years. It cannot support six billion high-technology people (or even one billion high-technology people and five billion low-technology people, as presently inhabit Earth) without causing ecological collapse of the biosphere. The issue to be addressed is what "mix" of technology-type populations is supportable and desirable for long-term survivability (of both the human species and the other species of

the biosphere). Under the condition that the total consumption of manufactured energy be comparable to the amount consumed by 200-500 million low-technology people, the number may vary from a high of 200-500 million (if the population is low-technology) to a low of 2-5 million (if the population is high-technology, using 100 times as much energy per person).

The "minimal-regret" population proposed in *Can America Survive?* consists of a single-nation high-technology population of five million and a low-technology population of five million hunter-gatherers distributed over the planet. Such a population consumes no more than the level E of energy. (Note that although hunter-gatherers consume no manufactured energy, they require natural habitat of about 25 square kilometres per person. It is not possible, therefore, to accommodate a population of five million hunter-gatherers if a low-technology primitive-agriculture/herding population covers the globe. From the viewpoint of resource utilization (ranging space, solar energy), a hunter-gatherer utilizes about ten to one-hundred times as much as a low-technology person (5-20 million vs. 200-500 million)).)

There are, of course, many other population sizes and compositions that would be unlikely to cause serious damage to the biosphere (e.g., no people at all!). As discussed in *Can America Survive?*, there are other reasons for recommending the preceding population as a feasible population size and composition for Earth. These will not be discussed here, other than to mention that the possibility of global war is eliminated by having but a single high-technology nation (planetary management organization) on the planet. In other articles, I have discussed a proposed organizational structure (synarchy, or synarchism) as the management basis for operating the planet (i.e., governing the human population).

2. Response to a Comment

This brief article was motivated by a remark made to me a few weeks ago that the "minimal-regret" population might indeed preserve the biosphere, but "how would the hunter-gatherers feel about the arrangement?" I must confess that I was initially surprised at this remark, until it occurred to me that the individual expressing the view had not read any of my works, including *Can America Survive?* His preconceived notion of "hunter-gatherers" was the common misconception that life for hunter-gatherers was, in the words of Hobbes, "nasty, brutish, and short." My friend was of the opinion that the hunter-gatherers (of the minimal-regret population) were impoverished, deprived people living in misery, whereas the high-technology urban population were living a wealthy existence with all material comforts. This representation is totally false.

As I, and many others, have observed, the life of hunter-gatherers is nothing of the sort imagined by Hobbes. It is a lifestyle that is, overall, exciting, meaningful, pleasant, comfortable, and leisurely. It has been estimated that hunter-gatherer societies can and do provide for all of their needs with about two days' work per week. The remainder of the time is available for a variety of discretionary social and cultural activities, such as socializing, exploration, discovery, and arts and crafts.

At the same time, the life of the members of the single-nation city-state (the planetary management organization) is also, overall, comfortable, meaningful, and fulfilling. From the viewpoint of the activities of daily living, however, the two lifestyles are radically different. It has been said that the major "paths to God" (paths to spiritual realization and

development) are love, knowledge and action. Not all people take the same paths, at the same time. To make life interesting, it is necessary that people and societies are different, and do different things. The greater the level of diversity, the greater the level of interest. Both populations of the minimal-regret scheme are engaged in meaningful and interesting activities. Those activities are, however, very different.

In the synarchic minimal-regret population, there is no global poverty and no global war. There is no global disease: the risk of a planetary epidemic is minimized, because the planetary hunter-gatherer population consists, as in the past, of independent and isolated tribes that intermingle to a very limited degree. There is no global famine. The scourges of civilization – plague, famine, and war – are eliminated.

A comment is in order concerning the amount of and kind of energy utilized by the three types of human populations discussed here (viz., the hunter-gatherer population, the low-technology population, and the high-technology population). We shall examine the energy requirements of four hypothetical populations: (1) a global population of five million hunter-gatherers; (2) a global population of 250 million low-technology people (primitive agriculture, nomadic herding); (3) a global population of five million high-technology people; and (4) a "minimal-regret" population of five million high-technology people and five million hunter-gatherers. Since each of these populations is considered to be about the maximum capacity of that type (without causing significant change to the biosphere), each of these populations hence utilizes all of the planet's solar energy.

A global hunter-gather population of five million uses no human-controlled ("commercial," "manufactured") energy. The amount of solar energy utilized to support this lifestyle is, however, massive. There are about 12.5 billion hectares (125 million square kilometres) of habitable land on the planet. For a global hunter-gatherer population of five million, the human population density is about four people per hundred square kilometres. The amount of solar energy reaching one hectare each day in the temperate regions ranges from 15 to 40 million kilocalories (the amount of energy captured by plants is about one percent of the amount reaching the Earth). (See Pimentel and Pimentel, *Food, Energy, and Society*, p. 13, for more discussion.) Over the course of a year, the average solar energy received per hectare is about 1.4×10^{10} (14 billion) kcal, which is the equivalent of about 452 thousand gallons (1.7 million liters) of gasoline per hectare per year. Each hunter-gatherer is hence realizing the benefit of 2,500 times this amount (since he requires about 25 square kilometres, or 2,500 hectares, of habitable land), or about 1.13 billion gallons (4.25 billion liters) of gasoline per year.

A global low-technology population of 250 million uses the same total amount of solar energy as the population of five million hunter-gatherers (i.e., *all* of it!), so each person utilizes 5/250 = 1/25 as much. They also use a small amount of "manufactured" (controllable) energy. At the present time, people in very underdeveloped countries utilize about 80 kilograms of oil equivalent (kgoe) per person per year of commercial energy.

A global high-technology population of five million also uses the same total amount of solar energy as the population of five million hunter-gatherers (i.e., all of it), and a certain amount of manufactured energy. At the present time, people in highly industrialized countries consume about 8,000 kilograms of oil equivalent per person per year of commercial energy. In the single-nation high-technology population of five million (of the

minimal-regret population), however, the per-capita utilization of manufactured energy will be much greater than the 8,000 kgoe level of current highly industrialized societies. The 8,000 kgoe figure is an average, and it is very low. Many of the people of a modern industrial society utilize relatively little manufactured energy, and there are high "fixed costs" of energy for a technological society (so that a small one uses more controllable energy per capita than a large one). The most productive members control vastly more, e.g., 100 times as much more, than the poor or even the middle-class members of the society. In a minimal-regret population, the high-technology nation may control, e.g., 100 times as much manufactured energy as today's average for highly industrialized nations.

(It should be recognized that today, most of the commercial energy comes from fossil fuels; at current rates of consumption the petroleum will be gone within less than 50 years, and the coal somewhat later (100-400 years). While it is not possible to substitute sustainable (solar) forms of commercial energy for the amount of oil or coal consumed by the planet's six billion people, it certainly is possible to do this for a global population of 250 million low-technology people or five million high-technology people.)

Finally, in a minimal-regret population of five million high-technology people and five million hunter-gatherers, the two populations share the solar energy rather equally, except for the fact that the high-technology population will consume, in addition, a large amount of human-controlled ("manufactured") energy. That amount (whether 8,000 kgoe or 100 times that amount) is negligible compared to the total annual amount of solar energy divided by ten million, i.e., 12.5 billion ha of habitable land x 1.7 million liters of gasoline per ha / ten million people = 2.125 billion liters of gasoline per person.

From the point of view of energy benefit, the hunter-gatherer is much better off than the low-technology person (who receives the benefit of 1/25 of the solar energy, and must work very hard to convert his meagre allotment of manufactured energy (animal power, wood, water power, wind power, biomass, etc.) into the things that he needs (e.g., food, clothing, shelter) or which his leaders demand (bricks, textiles, public buildings, palaces, temples, roads, canals, aqueducts, weaponry, luxury fabrics, jewelry, and agricultural surplus to maintain government and the military and provide for lean years).

The comparison of the hunter-gatherer to the high-technology person, however, is much more interesting and pleasant. Both are utilizing (receiving the benefit of) about the same amount of (solar) energy. Most of this energy is used the same way, i.e., to maintain the biosphere, but in the high-technology society a small fraction is used in a very different way: it is converted to manufactured (controllable) energy for technological purposes. The hunter-gatherer can take food and other products from an exquisite variety and bounty of plants and animals with a minimal expenditure of effort and can enjoy an endless variety of spectacular vistas every day. The hunter-gatherer works two days out of seven, whereas the high-technology urban dweller typically works five days out of seven (whether by choice or necessity). While the quality of life may be high for both the high-technology urban dweller and the hunter-gatherer, it is a radically different lifestyle. Both have the wherewithal to enjoy a meaningful and interesting and exciting existence, but the contexts in which that takes place are very different. From the viewpoint of "paths to God," the hunter-gatherer's lifestyle is dominated by action (hunting, fishing, socializing, adventure, local conflict), whereas the high-technology person's lifestyle is dominated by knowledge. In today's terminology, the high-technology society is a "knowledge society."

My friend's gut reaction was that the hunter-gatherer was "getting the short end of the stick," in the minimal-regret population paradigm. That is not at all the case. Both share the planet's solar energy flux equally. The members of both components of the minimal-regret population have freedoms and they have restrictions. They both have challenges, and they both have requirements and obligations. Their activities are very different. Some people would prefer the life of a hunter-gatherer to that of a member of the planetary management organization. It is very clear that most urban dwellers on the planet today, living in misery, squalor, oppression and deprivation, would choose either the lifestyle of the hunter-gatherer society (with 25 square kilometres of natural living space per person) or the lifestyle of a member of the single-nation city-state planetary management organization as preferable to his present existence.

That more people would choose one lifestyle to the other is not at all clear. The preference depends on personality, values and abilities (i.e., their location on their "path to God"). The hunter-gatherer is in fact much "wealthier" than the city-state dweller, in terms of freedom to roam and leisure time (i.e., in terms of freedom in space and time). The challenges in his life may be viewed by some as less complex, or less "civilized," and therefore less interesting and meaningful than those of the city-state dweller, but this is arguable, since it depends very much on the personality and stage of development of the individual. The member of the planetary management organization has an assigned mission (viz., a role in the planetary management organization), but so too does the member of the hunter-gatherer society (viz., his role in the tribe). Both have opportunities for spiritual development, but their life takes place in very different vocational contexts. The high-technology person is involved in management, science, engineering, and all of the other fields of endeavor of technological society. The hunter-gatherer is involved in the challenges of life in a natural environment. The high-technology person has far less leisure time than the hunter-gatherer, and, it may follow, less opportunity for spiritual development. This may help explain, as observed by many New Age writers (e.g., Thom Hartmann, Neale Donald Walsch) why primitive tribal societies appear to be more developed spiritually than modern technological societies.

An issue that I have not addressed here, or at length in my other writings, is whether or how or ot what extent individuals may move from the hunter-gatherer society to the high-technology society, or vice versa. That issue was addressed to some extent by Plato (in *The Republic*), but was largely avoided by Saint-Yves d'Alveydre in his discussion of synarchy. In Plato's (ideal) society, people could move into leadership positions (the "Guardians") by merit. In Saint-Yves' synarchic society, leadership is restricted to "enlightened initiates." Neither writer provided details on the mechanism for social mobility from the nonleadership class to the leadership class, or vice versa (e.g., how to measure "merit," or how to become an "enlightened initiate"). I do not have much to say about that issue at the present time, but will address it at a later date.

To summarize, both the members of the high-technology society and the hunter-gatherer society of the minimal-regret populations are deriving benefit from comparable amounts of solar energy (that benefit being preservation of the biosphere). There is much freedom of action and freedom from want, but their lifestyles (activities of daily living) are very different. Any comparison between them must recognize that their lifestyles are multidimensional in nature, and differ markedly on different dimensions. Since the lifestyles are not single-dimensional, it is not possible to rank them in simple fashion and declare that a member of one is "better off" or "worse off" than a member of the other.

Both are very well off, but in very different ways. From a general concept of "equity," both populations fare extremely well.

Perhaps my friend had confused the life of a "low-technology" person with that of a hunter-gatherer. The life of a low-technology person is truly miserable (except for the few wealthy rulers). He has little or no opportunity to take advantage of nature's bounty, as does the hunter-gatherer. He must provide for his family's needs on a meagre ration of manufactured energy. He must provide a considerable proportion of his productive output to the state or to his employer or owner. He has little freedom either in time or space. He must work hard every day, on meaningless, repetitive tasks. He cannot provide adequately for his family. His vocation destroys natural habitat. He has essentially no rights or privileges. With poor nutrition and sanitation, he suffers from disease. He may die in a war that is not of his choosing. His life is a mean one, of poverty, penury, deprivation, disease, violence, oppression and want. The low-technology society compares very poorly to either the hunter-gatherer society or the high-technology society of the minimal-regret population. It is, however, the way of life for most people on the planet today. (See Thom Hartmann's *The Last Hours of Ancient Sunlight* for more discussion of the advantages of the tribal life of hunter-gatherers over that of low-technology societies.)