

At the World Food Summit, Brown offered what was called the pessimistic "Malthusian" view (as opposed to FAO's limited optimism):

Food scarcity is likely to emerge as the defining issue of the era now beginning, much as ideological conflict was the defining of the historical era that recently ended. National political leaders everywhere will be thoroughly challenged by the demands placed on them by the prospects of growing food scarcity. Ensuring the food security of the next generation requires fundamental changes in population policy, energy policy, land use policy, water use policy, and, indeed, in the very definition of national security itself. Whether or not political leaders can respond quickly enough to avoid widespread political instability remains to be seen.

Roundly denigrated in Rome for his "demographics sophism," Brown's views were sharply criticized by Summit leaders — including the Pope. While the United States' position paper echoed many of Brown's concerns (then concluded its statement without promising more food aid to the UN), the prestigious international magazine *The Economist* reporting on the World Food Summit offered this evaluation of Brown:

"Food analysts at sober organizations such as the World Bank and Washington's International Food Policy Research Institute praise Lester Brown for shaking common complacency about food security. *Sotto voce*, however, they say that his predictions of impending disaster are 'probably nonsense.'"

Though *The Economist* in general reacts with a sure measure of sophisticated cynicism to the concept of a world food crisis — ("Most environmental panics about food seem to be just that — panics") — it is easy to make bold claims such as these from the center of affluence in the western world. Regardless of Malthusian or non-Malthusian trappings, the reality of hunger is much more profound on the plains of the Serengeti or the streets of Kinshasa.

In all objectivity, however, the assessment of the state of our planet is not an easy one. It is impossible to know all environmental and social conditions throughout the world first-hand. Any global view is the synthesis of the many sources of information from all over the world. Every one has its own peculiar agenda, spin, counterspin, or need for damage control — the United Nations and Lester R. Brown included.

If we assume that the truth lies somewhere between the commentary of *The Economist* and *The Earth First Journal*, and that the United Nations and the Worldwatch Institute represent opinions near-right and near-left of center, where do we really stand? How severe is the situation? And what will global warming mean to our children?

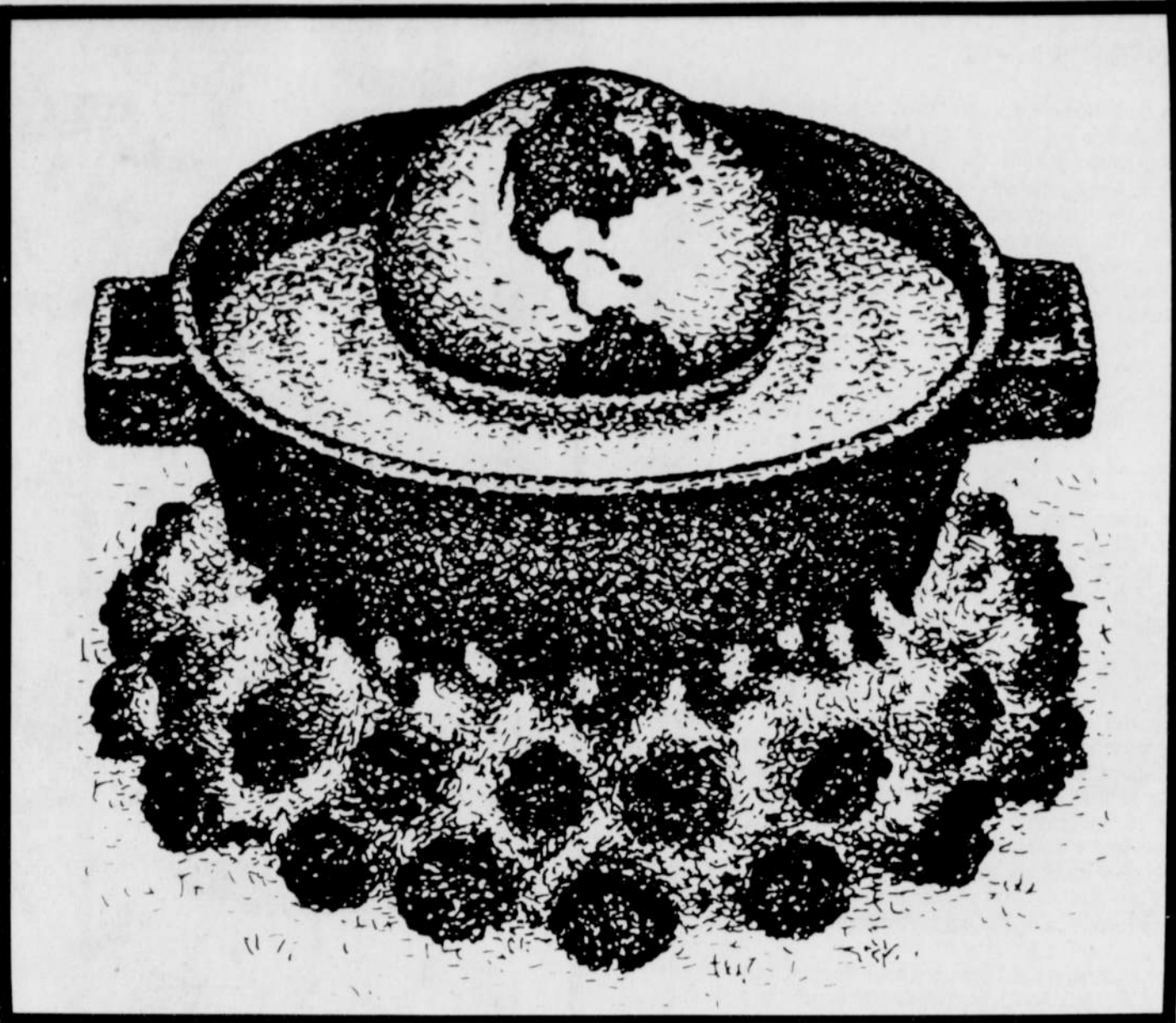
Basics of the Food Equation:

The carrying capacity of Earth is defined as the number of humans that can live sustainably on the planet. That is, live in equilibrium with themselves and the Earth's natural resources indefinitely. This numerical population limit or carrying capacity is a function of a wide array of variables, all directly related to the standard of living the populace chooses. More can live with less. Less can live with more. The most basic standard of life is measured by what a populace eats. The United Nations Food & Agriculture Organization uses 2,700 calories per day as a base-line figure for an individual's required nourishment. Imagine an equation for the Earth's sustainable food production that allows this level of caloric intake for everyone. In the very simplest terms, the primary variables in the equation would be the number of people to feed, the amount of arable land, the availability of clean water, the productivity of the seeds (plant or animal), and the viability of the weather. An evaluation of the present condition of each of these variables offers a valuable insight into the state of world food production today and into the next century.

People:

The world population at the turn of the 17th century was approximately 500 million. Two hundred years later (1800), that figure had doubled. It doubled again by 1920. By 1980, two billion had become four. Today the world population stands at 5.8 billion. At present reproductive rates, United Nations demographic experts say this number will maximize sometime in the second half of the next century between 10 and 12 billion. What will cause this hypothesized population plateau? We all must hope it will be the result of an evolving conscious human effort. It could just as easily be the press of natural resource limitations or political coercion.

In the mid-1960s the annual population growth rate peaked at 2.1%. After an intervening 30 years of increased environmental and population awareness, that number has been reduced to 1.4%. This should be further reduced to 0.5% for a viable zero population growth (ZPG). Today most world governments are generally committed to "replacement population" (two children to each couple) and an eventual ZPG. This kind of forethought is exactly what is needed to ensure the quality of life we would want for our children and their children.



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For the most part, world leaders believe that economic development is the way to responsible fertility rates. (Population growth rate is fertility rate minus mortality rate.)¹

The theory of "demographic transition" says that industrial development brings about societal wealth, populace education and a gradual awareness for the necessity of planned parenting. This evolution has proven true for most of the developed world (the First World) — Western Europe, North America, Japan, New Zealand and Australia. Though there is quite a way to go for the rest of the world, UN demographers feel that there will be a fertility transition for developing countries (the Third World) as their standards of living rise. (The Second World used to be the Russian communist empire.)

In gross numbers, the developed world is home to 1.4 billion people, the developing world 4.4 billion. The populations of the Third World countries, however, are growing about three times faster than those of the First World. At the same time, the developed countries are using the Earth's natural resources at a rate three times faster than the developing countries (ten times per capita). Despite the huge inequity suggested here, there is clear expectation among the richer nations for the rest of the world to harness their fertility rates in the next 25 to 35 years — if the world population is really to stabilize at the 10 to 12 billion mark in the next century.

Within this reasoning is the fact that even should demographic transition bring about global replacement reproduction by the year 2030, and there is no guarantee of that, the world population would still continue to grow for some time afterward due to the irresistible force of "population momentum." Ann and Paul Ehrlich's book *The Population Explosion* defines "population momentum" as "the tendency of a previously growing population to keep expanding long after reproductive rates have been reduced," much like "a supertanker requires several miles to come to a stop after reversing its propellers." The reason for this is that at any time prior to a population entering into replacement reproduction, a high portion (30% to 45%) of the populace will be under the age of 15. "The bottom line on demographic momentum is simple: barring plunges in the birthrate that take family sizes well below replacement reproduction, or substantial rises in the death rate, it will take 50 or 60 years after a rapidly growing population reaches replacement reproduction to achieve ZPG."

One alternative to demographic transition is coercive birth control. This exists to some extent in China today. The non-choice is that the population merely blooms past the carrying capacity of Earth and resource shortages bring on Ehrlich's "substantial rises in the death rate." We might label this "free market" Darwinism, as presently 1.3 billion people live on a dollar a day or less and for all practical purposes are invisible to the market. One way or another, population equilibrium will eventually settle in at a bio-social maximum.

Though there is wide debate on how or when, and even if, world population will stabilize, if we accept the United Nations' assumptions as our best working hypothesis, at some point during the next century our number will maximize at approximately twice what it is today. Since arable land is already at or

near its viable limit, this measure means present crop yields per unit of land must double in the next 50 or 75 years to meet projected population gains.

Land:

When we talk about feeding the world's human population, discussion centers on grain. Grain (a term that generally includes wheat, corn [maize], rice, barley, oats, sorghum and soybeans) serves as the basic foodstuff, either on the table or for raising animal protein sources, for the majority of the Earth's population. This became increasingly so during the 19th century when the Industrial Age entered into full blossom and the rural populace started a steady migration to burgeoning industrial locales. Because grain could be stored for long periods of time without refrigeration and transported in relatively easy-to-handle bulk, it was the most efficient and cheapest way to feed the collecting urban masses. The demand for bread from the industrializing cities of Europe and the eastern United States pushed open the vast North American prairies to wheat and corn farming. With the great stretches of farmland in the U.S. and Canada, it seemed for well over 100 years that the world had an inexhaustible bread basket.

Unfortunately, in the last 20 years industry's voracious appetite has caught up with Earth's "inexhaustible" reserve of arable land. The most obvious reason for this is the building of homes and factories and roads that take much of the prime land from seed. Not so obvious is that it also changes the way we farm. As the growing metropolis draws people from rural areas and farming occupations, the many small farms become fewer large farms. Multi-crop truck farms become monoculture plantations. Family farming becomes industrial agriculture. The large farm is more productive regarding overall yield, and may even be the only way to supply the quantity of grain needed to feed the huge cities of today's world. But because of the techniques used, agribusiness-style farming is extremely costly in terms of topsoil loss.

In the equation of food production, topsoil is just as critical as expanses of open land. Without decent topsoil, land is little more than desert. Topsoil is literally the living surface from which terrestrial life arises. Not only is it composed of rock chips, clay, sand, minerals and organic detritus, it is also an interdependent living community of insects, worms and micro-organisms that contribute to the vitality of the soil.

Industrial agriculture amounts to a literal mining of this topsoil — that is, a drawing up of the soil's nutrients through edible biota. Gradually, crop after crop, the soil is depleted of its minerals, nutrients and organisms. On a properly husbanded farm or in nature the soil is fertilized organically from the waste products of what lives on it; the soil sustains as a living, breathing thing. On a large commercial farm in these times, chemical fertilizers are invested in depleted soil with each new crop. When the ground is open and heavily worked with fertilizer, especially in large flat expanses, though abundant with nitrogen and phosphates, it becomes dead and lifeless. The microbes are gone. The organisms die. The topsoil erodes rapidly with the weather and is washed away with the wind and the flush of water. Over time, the soil eventually finds its way to the mouth of the nearest river. This is occurring at alarming rates all over the world. "The Yellow River in China carries 1.6 billion tons of soil to the ocean annually," Lester Brown wrote ("Conserving Soils") in *State of the World 1984*. "The Ganges of India deposits 1.5 billion tons of soil into the Bay of Bengal each year. The Mississippi, the largest U.S. river, carries 300 million tons of soil into the Gulf of Mexico yearly."

As stated before, the combination of industrial sprawl and topsoil loss is diminishing arable land worldwide at a steady rate of 1% a year.

Water:

All of us use water everyday. The need for clean water is visible in our rivers, our cooking, our washing and in quenching our thirst. As a city grows and the population density increases, the demand for water increases not proportionately but exponentially. This occurs not just through households or industrial use, but through the need to develop marginal land into cropland to feed the additional people. (To grow one ton of grain requires 1000 tons of water.) Recent FAO appraisals predict that by the year 2025 overall water requirements, industrial, household and agricultural, "appear to over commit all accessible runoff by some 5%."² This compounds the

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