Malthus—Right or Wrong?

That depends on what part of the globe we're considering — climate is supremely important

by William C. Paddock

Two hundred years ago, T. Robert Malthus published his *Essay on the Principle of Population as it Affects the Future Improvement of Society.* Essentially it said farmers cannot produce food as fast as "the passion between the sexes" can produce people, thus Man is doomed to a future of famine, poverty, and the horsemen of the apocalypse. The prediction was so logically expressed that it set off an immediate debate that still continues. "Is Malthus correct?" — or, phrased differently, "Can our civilization survive?"

One side, the neo-Malthusians, such as Stanford's biologist Paul Ehrlich (*The Population Explosion*), predicts doom unless population growth stops. The other side, the pro-natalists, represented by the late professor of marketing Julian Simon[1] and journalist Ben Wattenberg,[2] maintains that instead of worrying about too many people, we should worry about too few people or "an emptier planet." Which is correct?

That a man in 1798 could write an essay still being argued about is not surprising when one remembers his times. Malthus was no country bumpkin. He was well-educated, a mathematician, a student of his period, corresponding regularly with Europe's leading philosophers and economists. His was a yeasty age, on the cusp of the Industrial Revolution, when Luddites protested machines making labor redundant, while agriculture boomed by using new crops from the Americas and new science from England's recently established agricultural schools.

Malthus, growing up in rural England, thoroughly understood agriculture, but his experience was limited to the temperate zone. He assumed all the world functioned like Europe. He had no knowledge of the tropics. In a strange, twentieth-century way, today's pundits have an even narrower vision. In spite of their travels in the tropics, most lack experience with tropical farming, or, for that matter, agriculture of any kind. Like Malthus, today's savants see ours as one homogenized world, a mass of humanity copulating and farming with the end result the same for all.

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The world has many different climates, each affecting man's ability to feed himself. However, fundamentally, our earth is divided into two distinct worlds: the tropics — that portion of our planet between the Tropic of Cancer and the Tropic of Capricorn — and the temperate zone, above and below those latitudes. The difference between the two *must* be considered in any Malthusian discussion.

Much of the temperate zone has already brought its birth rate into balance with the death rate and in areas the population now grows negatively. Furthermore, the wizardry of most 20th century agricultural science is applicable only to the temperate zones which also possess the agricultural advantage of cooler weather, better soils, and longer days. It is here in the temperate world, and *only* here, that the views of the pro-

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natalists Simon and Wattenberg are applicable.

The tropics are different. Not only are they cursed with 75 percent[3] of the world's population growth, they also have an agriculture that can neither adequately feed its people nor make use of modern science. As regards the tropics, Ehrlich and Malthus are 100 percent correct.

Archaeologists tell us that civilizations arise when farmers can grow more food than they and their families can eat. It is the farmer's *surplus* that makes a civilization possible. There are some minor exceptions where a people are blessed with something besides agriculture with which to trade — gold, oil, copper, or manufactured TVs or automobiles. But in the end it's the same: no food *surplus*, no civilization.

The surplus is dependent only in part on the productivity of the farmer. It is *equally* dependent upon the *number* of people that must be fed. If each farmer is productive enough to feed ten people, nine people are freed to build a pyramid, write a poem, design a computer. But when the population explodes and there are twenty to be fed, then everyone must grub for food. Famine threatens, disease follows, and war prevails among groups, tribes and nations. This simple fact has been lost to us in the temperate West because 98 percent of the citizens are far-removed from the farm. Thus, our leaders direct foreign policy with no understanding of the resource base of the world's poor. Efforts to stabilize governments or feed the hungry fail as troops are sent to Haiti and Somalia, food to Ethiopia, and fact-finding groups to Central America. Some may puzzle, "What's wrong with our help?" but no one asks, "What's wrong with the *tropics*?"

What's wrong with the tropics is geography which so restricts the farmer he can't produce enough *surplus* to support even today's civilization — jobs, houses, schools, highways, and democracy. And every day there is less surplus as more people arrive on the scene to share it. Our decision-makers extend foreign aid as a substitute for a surplus and believe that in so doing they will prevent a Malthusian disaster. They wear the same blinders as the sovietologists of the late 1980s who, not seeing the paucity of the Soviet surplus, could not see the coming collapse. Over 90 percent of the area is difficult or impossible to farm because it has less than 20 inches of rainfall a year, or too short a growing season (Moscow is as far north as Canada's Hudson Bay).

The misunderstood tropics

The *tropics* — the very word conjures up a lush, verdant dream world. The *tropics* — where one can loll all day in a hammock and pluck a banana from a tree. The *tropics* — where one can toss some seed on the ground and then jump back as the plants burst forth from fertile soil. The *tropics* — where the ease of living makes its people indolent, slothful, shiftless. The *tropics* — to which, lacking in Yankee get-up-and-go and ingenuity, we must ship our food and send a dole to prop up the governments.

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How false is that view!

John Kenneth Galbraith, in *The Affluent Society,* said that everything 500 miles north and south of the equator is undeveloped, and it's not by accident. He could have said 1200 miles, for the whole tropical area is cursed with "development" problems. Except for temperate zone China, the former Soviet Union and its periphery (where much of the area is too cold or dry for good agriculture), nearly every poor country in the world is *in* the tropics. After fifty years of development effort, including a trillion dollars[4] in foreign aid, the recipient countries remain the *less well-developed, emerging, less privileged, have-not, catch-up, low income, needy, poorest third, recipient, expectant, restless* — all euphemisms for *tropical.* Washington officials who have never farmed the area tell us the people there are poor because they need land reform, agricultural research, better banking systems, democracy, education, more health clinics, loans, etc. None are basic causes for the poverty.

The Hudson Institute's founder, Herman Kahn, used to quip that the United States was lucky to

have developed its resources before the Rockefeller Foundation brought it modern medicine. The tropics were not so lucky. During the last fifty years, before anyone could improve farm techniques, an army of do-gooders — foreign aid technicians, Peace Corpsmen, missionaries — evangelized throughout the tropics on the advantages of boiling water, sanitation, and modern medicine. They brought death control without birth control. The population exploded and we still don't know how to better farm the area. Until now, the additional people have largely been fed by farming further into the rain forests and farther up the hillsides.

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In the late 1960s new varieties of wheat and rice were developed to better use irrigation and fertilizer. A Green Revolution was said to have been caused by the resulting yields — the term was coined by the head of the U.S. foreign aid program in a fund-raising speech, and was one the press loved. No facet of the international foreign aid effort, then twenty years old, ever received such laudatory praise with so little examination. The Green Revolution hype was oblivious to the fact that it was largely limited to just two crops and to the temperate zone. The ignorance was reflected in the announcement by the 1970 Nobel Peace Prize Committee in its preposterous statement that the Green Revolution:

1) *"made it possible to abolish hunger…in a few years"*
2) *"contributed to a solution…of the population explosion"*
3) *"in short we do not any longer have to be*
4) *pessimistic about the economic future of the developing countries."*[5]

Population

First, right off, let's make it clear: for the 20th century, Malthus was *wrong* about the passion between the sexes. While that may get a president into trouble, it is not the cause of today's population growth. The current population explosion is due not to a rising birth rate but to a falling *death* rate. The near equilibrium between births and deaths which had existed for centuries with a slow rise in population was shattered fifty years ago by the efficiency of the medical and public health professionals.

Previously, growth had been creeping up for ancillary reasons (better transportation of food, opening of virgin lands, discovery of the causes of diseases, etc.). But the major, overwhelmingly catastrophic blow to the quasi-equilibrium came between 1936 and 1940 with the discovery of sulfas, penicillin, and DDT — the latter probably the cheapest and most effective insecticide the world will ever know. In the 40 years before 1940, the population of Mexico grew by 50 percent; in the next 40 years it grew five times faster. The same happened in varying degrees throughout the developing world. Sri Lanka's death rate was cut in half during the five years following World War II. DDT's control of the malarial mosquito doubled British Guiana's population in ten years. Haiti, with only 1,000 doctors, extended the life expectancy of its seven million citizens from 33 to 55 years. The world had begun adding more than a billion people every generation.

Today, birth rates are falling everywhere, which is why the popular press is worrying about the "birth dearth" and the "population implosion." Unfortunately, as with agriculture, there are two separate population worlds, one temperate and one tropical. Those countries where couples have two-or-fewer children live in the temperate zone of Europe, the U.S., Canada, Japan, South Korea, etc. (plus a few exceptions like Thailand and Singapore). Temperate China, with its severe population control policies, may soon be in this category.

In contrast, consider tropical Africa, Asia and Latin America. There women still average four or more children and, unlike in the past, most of the children live. There, too, a third or more are under the age of 16 and coming into child-bearing age. For years to come any future drop in the birth rate

will be canceled by an increasing number of women having children.

Historian Barbara Tuchman says, "Size of population affects studies of everything — taxes, life expectancy, commerce and agriculture, famine and plenty,"[6] i.e., civilization itself. Civilization in the temperate zone with its stabilizing population does not seem threatened. But the ghost of Malthus stalks the tropics.

How much food is needed?

Population in the tropics already exceeds the carrying capacity of the soils. If a Malthusian disaster is to be avoided food will have to shipped from the temperate zone. Malthus wrote that population expands to the limit of the food supply and, therefore, food aid artificially increases the size of the population. As long as the population of the tropics lacks the motivation to stop its growth, food aid only postpones the inevitable.

The world now has 4 billion people that are poorly fed. A Hunger Program report from Brown University[7] estimates that one billion people do not receive enough food for an "active work life" and another nearly half billion either receive an insufficient amount of food for the normal growth of a child or for minimal activity as an adult. But hope springs eternal among the pro-natalists who point out that statisticians have calculated that the world's agriculture actually produces enough food to feed everyone. The problem is not too many people but, they say, poverty and/or uneven food distribution. There is no evidence this will change.[8] For fifty years the World Bank and foreign aid have tried and failed to reduce the number of poor.[9] However, if poverty should decrease, the remaining poor are in a Catch 22. Decrease poverty, food demand rises, prices escalate, farmers respond by using more marginal, erodible soils. More food results, but its cost is higher and the poor are still hungry.

In the next 25 years the world's population will surely increase by two billion, three-fourths of which will be in the tropics where, surprisingly, the greatest threat to the poor will be a new affluence. Since 1990 one-world banking, one-world markets and free trade, one-world capital chasing cheap labor, and one-world transportation which makes the results available to everyone overnight — these have combined to produce a new affluent class *everywhere*, including the poorest of poor countries. Because of its greater wealth, affluence threatens the temperate zone's resources the most — a fact ignored by the pro-natalists. But it is a worldwide threat. For example, the 17 five-star hotels in India's capital use as much water as do 1.3 million of India's poor who lack plumbing. The first thing newly affluent people is upgrade their diets, which means they eat more meat. When a family has a pound of chicken on Sunday rather than lentils and rice, the grain use goes up that day by 4 pounds — if it's beef, 7 pounds. In China during the 1990s this rise in affluence alone accounted for two-thirds of the increased grain consumption. Even though its agriculture has the advantages of the temperate zone one authority, Worldwatch Institute's head Lester Brown, sees China as a threat to *all* hungry nations. He believes China's rising affluence will demand, and pay for, the world's entire export supply of grain. Goodbye famine relief, hello Malthus.

There are a hundred different estimates of how much additional food will be needed for the population in the future. The one I prefer, and which is similar to many others, is that of Iowa's *Wallace Farmer* , a publication far closer to the export market than Washington's think tanks. It projects a 300 percent increase in *demand* for food in the next thirty years.[10]

Tropical agriculture is not now able, nor will it be able in the future, to keep up with its population growth. Twentieth century science has impacted largely on the temperate zone, not the tropics, as demonstrated by Norman Borlaug, father of the Green Revolution. In the 1940s he was hired by the Rockefeller Foundation to work in the tropics on Mexico's basic food, corn. As would be expected, tropical southern Mexico has more malnutrition than its temperate North. Borlaug, resisting orders from the Rockefeller Foundation,[11] turned his back on the tropics to work on the country's luxury grain, wheat, in northern Mexico on its most productive irrigated land. The wheats he developed proved revolutionary in the temperate portions of Mexico, India, and other similar areas.

When a tropical country is largely agricultural — and most are — then the production from its climate-dependent farmers results in a surplus so small its people are impoverished. A 1993 declaration by the revolutionary Zapatistas, issued from Chiapas in tropical Mexico, tells it all:

We have nothing to lose, absolutely nothing,

no decent roof over our heads, no land, no work, poor health, no food, no education, no right to choose our leaders freely and democratically, no independence from foreign interests, and no justice for ourselves and our children. We are the millions of dispossessed, and we call upon all our brethren to join our crusade.[12]

Problems of the Tropics

Farm problems of the tropics result from (1) the heat, (2) non-glaciated soils, and (3) the length of day. We're 10,000 years too late to do anything about the glaciers, but if we knew how, we could tilt the earth and correct the other two problems.

Generalities are hard to make for the tropics because they vary so greatly. For instance, snow is found the year around at the equator on peaks in Ecuador and Tanzania. But where most people live one thing is certain: farming is extremely difficult. Plantation agriculture (coffee, rubber, sugarcane, bananas, etc.) succeeds in the tropics because it concentrates the capital needed to combat the obstacles. In recent years we have seen two examples of areas where governments have tried to ignore the limitations. In the first case, Fidel Castro announced when he took over Cuba: "we will abolish our slave master, sugarcane." Cuba has tried a variety of alternative crops but sugarcane remains the country's slave master; climate is a more severe dictator than Castro ever thought of being. In the second case, when the university-trained Sandanistas took over Nicaragua, they announced a plan to stabilize the price of corn by stabilizing production. The plan was to increase irrigation and plant monthly. The result: with corn always available to support the multiplication of pests, there was no corn to harvest.

HEAT

Too much heat can reduce crop yields in several ways. Corn breeders measure heat by Growing Degree Units (GDU). Iowa usually receives the right number of GDUs — Texas, too many for optimum yield. Guatemalan and Honduran corn suffers the most at latitude 15°(+/- 5°), receiving more heat there than anywhere else in the world. Cool nights in Iowa reduce the number of GDUs there, but not in the tropics.

Tropical environments are tough environments for man, beast and plant. South Florida, which is not even in the tropics, was a wasteland before air-conditioning. High temperature increases respiration and biological activity; organic matter needed for nutrients and soil tilth quickly rots and, with rains, easily leaches away. The tropical peasant can lose as much or more of a crop in storage as in the field, as heat speeds the growth of weevils and fungi. Losses of a staggering 20 to 40 percent of their harvests are reported, for example, in Brazil, where storage losses to beans have been large enough to cause periodic food shortages.[13] In addition, high respiration rates require more energy for the tropical farmer who needs more calories than if he lived in a milder climate. In the low Latin American tropics you see no draft animals, no horses nor oxen, while you see some in the cooler highlands. An explanation is that the soils are so unproductive in the lowlands that the farmer, after feeding his family, has nothing left over for a draft animal.

A high percentage of soils in the humid tropics are acid, in part because high temperatures not only accelerate biological activity but chemical breakdown of soils as well.[14] Acid soils reduce the availability to plants of some essential nutrients.

LACK OF GLACIATION

When scientists have done everything possible to adjust the soils in the Amazon Basin, using all necessary nutrients, the land produces no more than half what one would expect in the U.S. Midwest.[15] Something besides the nutrients and pH inhibit yields. A look at global maps of soils shows that poor soils dominate in the tropics while the more fertile soils are in the temperate zones. One reason is that the southern latitudes were never glaciated and thus lack the substructure needed for high fertility.[16] I have a farm in Iowa that was glaciated and it consistently out-produces another farm I own 24 miles further south, and which was not. Poor soils make poor nations.

LENGTH OF DAY

In addition to heat and soils, there is still another inherent limiting factor in the tropics. At the peak of northern Iowa's growing season, crops have days of 15½ hours while at the equator there are only 12. Thus, Iowa farmers receive 3½ more hours of light with which to manufacture carbohydrates and fatten their harvests than do those at the equator. The same applies to Asia's rice, a crop generally considered tropical but which produces its top yields in temperate Japan.

DIFFICULTY OF FARMING IN A HOT CLIMATE

Cold weather is a farmer's helper for it kills or slows the progress of pests, including weeds. When corn is planted in Iowa around the first of May, the soil is cold, germination is slow as is all plant growth for the next several weeks. This allows the Iowa farmer time to control weed growth with several cultivations. By the time temperatures rise and corn is "knee high on the 4th of July," any remaining weeds are shaded and do not compete with the corn. In contrast, the farmer in the low tropics tries to plant just before the rains begin,[17] but not too early or the birds will eat the seed. This happens to be the hottest time of the year so when the rains come, the corn *and weed seeds* germinate immediately. The farmer quickly begins to cultivate the corn. By the time he has hoed a few hundred feet, he must start all over again to kill new weeds popping up behind him. A tropical peasant with a hoe may farm only four or five acres. The early Iowa settler, with a horse, farmed 40 or more acres, raised more corn than he could use, sold the surplus and eventually he and his neighbors became rich enough to support Iowa's schools, roads, etc.

In large areas of the tropics the life of the peasant has changed little during the past 500 years. He still suffers from an assortment of afflictions — malaria, worms, dysentery, etc. — and while he may now have a hoe and a machete, implements of steel rather than stone, his ancestors may have found it easier to farm.

Where slash-and-burn agriculture is the norm, the peasant formerly would let his unused land lie fallow for a number of years — the longer the better. Seven to nine years is best for then there is time for enough brush and weed growth to give an intense "burn" prior to planting. Now, with today's greater population, the resulting land shortage requires fallows of only four, maybe three or less years — too short a time to produce enough weeds for a fire hot enough to do a good job of killing the weed seeds, insect eggs and fungi. Likewise, fewer nutrients are released for the crops since less heat cracks open fewer soil particles. Population pressure in the tropics means lower yields per acre.

It is said that because of year-round warmth tropical farmers have an advantage over temperate zone farmers by growing two, three or four crops a year. In a few cases, such as irrigated rice, this is possible. For most crops there are not enough days in a year for more than two harvests. But it is not an easy thing to raise two crops. When I have done it, the build up of insects and diseases on the first crop often made the second crop not worth the effort.

Finally, the weather is more variable and less reliable in the tropics than in the temperate zone. Historically, temperate zone famines are due to disease and insects destroying the crop (e.g., the Biblical locusts of North Africa and the famine in Ireland caused by a fungus killing the potato). In contrast, famines in the tropics result from droughts due to a failed monsoon or short rainy season. Twentieth century science can usually control the plant pests, but can do nothing about the weather.

Can the tropics prove Malthus wrong?

The people of the tropics have two options for defeating Malthus: 1) a short term one of increasing farm production and 2) a long term one of stopping population growth.

INCREASING FARM PRODUCTION

There are almost always ways to increase farm production. For example, more fertilizer or irrigation. But further use is always threatened by the Law of Diminishing Returns. Malthus, who independently discovered this law, showed his irritation with those unfamiliar with farming when he first wrote about it saying it should "be evident to those who have the slightest acquaintance with agricultural subjects…" The law explains both why a second candy bar doesn't taste as good as the first and why there is a limit to how much fertilizer and irrigation can be used profitably. Thus, in the developing countries between 1970 and 1990, fertilizer use grew by 360 percent with a similar growth in new irrigation projects. But these greater inputs were not all cost effective, so fertilizer use and irrigation are now

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actually declining. Since 1970, a string of international agricultural research stations has been built around the world but in spite of great expectations, there are no new agricultural breakthroughs on the horizon. If, indeed, 21st century plant breeders and DNA engineers surprise us with a breakthrough, it is likely to be temporary. The Mexican experience shows why.

In 1941 Mexico was essentially food self-sufficient when the Rockefeller Foundation replaced its medical team there with a team of qualified agricultural scientists given the specific goal of increasing yield per acre of two basic foods: corn and beans. And they succeeded. But, *a la* Malthus, yields rose only about half as fast as did the number of Mexicans, and in less than forty years Mexico was importing a quarter of its food.[18] Today, even though an estimated ten percent of the population increase has emigrated to the U.S., 66 percent of the remaining population suffers from some form of malnutrition. From 1970 to 1990 malnutrition of rural children doubled.[19] Even if science were to find an agricultural breakthrough for the tropics, the result would only postpone a crisis so long as population growth continues.

"During Zamorano's 55 years, Central America's population has grown from seven million to 35, destroying any chance for an educated youth to feed tomorrow's world."

Stopping Population Growth

There is but one way to avoid the Malthusian disaster. Stop population growth. Malthus' world was one where nearly everyone farmed and towns were mere hamlets. The world at that time had only two cities with a million people: London and Paris. By 2020 there will be seven megalopolises, each with 20 million people, and all but one will be in the developing world. Now nearly three billion people live in cities. This explosive urbanization, most of it occurring just since 1970, is changing mankind as dramatically as did the switch from hunting and gathering to agriculture 10,000 years ago.

As mentioned previously, the tropics have seen a fall in the birth rates (outpaced by a fall in the death rates) due largely to this urbanization.[20] Farm poverty pushes the rural poor into the cities which now absorb 90 percent of the population growth. The festering masses of urban poor have needs for jobs, food, housing, education — needs which tropical governments cannot satisfy. The cities become pressure cookers of civil unrest simmering with deprivation, injustice and hunger, ready to explode into lawlessness. Every tropical government wants to keep the rural farmer out of the city and down on the farm. Since they do not know how to make farming more profitable and thus more appealing, the farmer, along with everyone else, must be convinced to *want fewer* children.

Is this possible? Yes, if there is a will. A hallmark of the 20th century is its advertising industry which seemingly can sell anything — refrigerators to Eskimos or the concept "stop at two" children. Will we use this talent to prove Malthus wrong? Future historians will say, "no," that our leadership was too gutless. That harsh conclusion is based on what recently happened in a situation that was *ideal* for action.

Honduras is a tropical country but far luckier than most. While two of its cities have had explosive growth, 60 percent of the labor force still works the land producing 75 percent of its export earnings. Through the vision of an American agricultural industrialist, Honduras possesses the world's finest tropical agricultural college, known as Zamorano. It is autonomous, richly endowed with a six square mile campus, dozens of architecturally uniform buildings of hand-cut stone, and a distinguished teaching and research faculty. This is no rinky-dink school! Highly competitive entrance requirements and tough academic standards have produced thousands of graduates who have become ministers of agriculture, heads of research departments, leaders in all phases of agro-business, collectors of countless advanced degrees from the best U.S. universities, and, most importantly, farmers and farm managers. The college serves all of Latin America but Honduras benefits the most from its presence.

Furthermore, Zamorano's Board should be as enlightened as any in the world, having had among its members through the years: a Rockefeller Foundation president, a Peace Corps director, U.S.

university chancellor, Nobel laureate, Boston Brahmins (some on the Harvard Board of Overseers) along with Latin American movers and shakers. It is a group which recognizes the world food problem by the slogan it has adopted: *Teaching Today's Youth to Feed Tomorrow's World.*

How successful have Zamorano's graduates been in feeding the people of Honduras?

Fifty percent of the Honduran diet is corn with more land planted to that crop than all other crops combined, yet the price of corn is about three times higher than its price in Iowa. The country's average corn yield in the 1970s was 18 bushels to the acre; in the 1980s 19 bushels, and in the 1990s 20½. In Iowa, for comparison, the yield is 135 bushels per acre.

A more honest reply would have been, 'We are scared as hell of the word <u>population</u>.'"

Honduras' exploding population has largely been fed, as in other tropical countries, by farming farther and farther up the hillsides and farther into the rain forest — and by importing food with the help of foreign aid. Nevertheless, per capita agricultural production has been falling since the 1970s at about 1.3 percent each year. A not surprising result: forty percent of its school children show chronic malnutrition with the percentage increasing. Honduras ranks 38th from the bottom of the world's poorest nations with per capita income dropping from $720 in 1985 to $600 in 1996 despite receiving an almost unbelievable $1.4 billion of U.S. foreign aid during that period.

Why the failure?

During Zamorano's 55 years, the population of Central America has grown from 7 million to 35 million, destroying any chance for *an educated youth to feed Honduras' tomorrow.* The stress imposed on Honduras by its current population size — still growing at 3.2 percent a year, doubling every 22 years — is more significant to its future than any historical event, overriding even the importance of the Spanish Conquest of the 1500s or the independence movement of 1820.

On its 50th anniversary, Zamorano's board, looking ahead at the coming years, instituted a self-examination and future planning program for the institution. Changing times suggested changing approaches. When the college was founded, population was a non-issue and the teaching of youth *to feed tomorrow's world* merited an approach quite different from that required by today's demographics. Alas, the study totally ignored population as a factor and its threat to the goals of the college.

When the shortsightedness of the omission was pointed out to a long time Zamorano trustee, the question was asked: "What should Zamorano do?" A report to the board resulted, written with the input of several who recognized Honduras' potential as a showcase for the tropics. A plan was submitted showing that if educated youth were to feed the Honduras of tomorrow, Zamorano must help stabilize the country's population growth. Knowing that birth control or family planning might frighten the board, the plan recommended ignoring the subject and instead concentrating on the sale of a single idea: *more people mean more problems.* Listed were consultants and organizations with experience in motivating populations to want fewer children through the use of radio and TV soap operas, 30-second radio commercials and high-impact billboards. Possible sources of funding were identified and $5,000 was offered to pay for two or three resource people to lead a discussion with the board.

And what was the response?

"We all agree that Zamorano is not in the birth control business." The board's agenda will be too full" to consider the submitted proposal. A more honest reply would have been, "We are scared as hell of the word *population*." And so, as President Truman reminded us, "a great, serene and peaceful future can slip from us quite as irrevocably by neglect, division and inaction, as by spectacular disaster."

Zamorano's timidity explains the on-going tragedy of the tropics. During the next 30 years the population of the tropics will double. Many countries, like Honduras will double sooner. More people does not just mean more hunger, but more problems of every kind. It means more teetering governments juggling democracy in an anarchical climate of repression, coterminous with revolution.

Welcome to the 21st century.

Our planet is strewn with the remains of civilizations — as often destroyed by depleted soils as by a poor day on the battlefield. If today's tropical civilizations fall to anarchy, it will not be for lack of warning, a warning given two hundred years ago this month by Thomas Robert Malthus. TSC

NOTES

[1] Simon, Julian, "What the Starvation Lobby Eschews." *Wall Street Journal*, November 18, 1997.

[2] Wattenber,g, Ben J., "The Population Explosion Is Over," *The New York Times*, November 23, 1997, p.60.

[3] A well-accepted figure is that 95 percent of population increase occurs in the developing countries. Subtracting numbers for temperate zone developing countries (China, North Africa, Afghanistan, etc. the figure 75 percent seems to be an acceptable calculation.

[4] The amount is considerably larger though nearly impossible to calculate accurately since there are a great variety of aid programs. The trillion dollars is conservative, dating from 1987: Greenwald, John, "Hard Times for Foreign Aid," *Time*, February 9, 1987, pp.38-39.

[5] Weintraub, B., "U.S. Agronomist Gets Nobel Peace Prize," *New York Times,* October 22, 1970, pp.1, 18.

[6] Tuchman, Barbara W., *A Distant Mirror,* 1978, New York: Knopf.

[7] Millman, S. R., *The Hunger Report: Update 1991*. The Alan Shawn Feinstein World Hunger Program, Brown University Press, pp.8-9.

[8] "Sustainable poverty reduction is the overarching objective of the World Bank, the benchmark by which our performance as a development institution will be measured." Lewis Preston, World Bank president. *Poverty Reduction Handbook*, World Bank, 1993, 317 pages.

[9] Ahjlburg, Dennis A., "Population Growth and Poverty," *Population and Development: Old Debates, New Conclusion*, Overseas Development Council, 1994, p.131. "Percentage of people consuming less than $375 per year was constant at 33 percent in both 1985 and 1990, and the number in poverty grew during this time by about 2 percent per year…"

[10] *Wallace Farmer*, March 1996.

[11] He threatened to resign if he did not get his way. Bickel Leonard, "Facing Starvation," *Reader's Digest*, 1974, p.181.

[12] Barry, Tom, *Zapata's Revenge: Free Trade and the Farm Crisis in Mexico*, South End Press, 1995, 317 pages.

[13] Schmidt, Karen, "Genetic Engineering Yields First Pest-Reistant Seed," *Science*, August 5, 1994, p.739.

[14] Sanchez, Pedro A., "Management of Acid Soils in the Humid Tropics," *Management of Acid Tropical Soils for Sustainable Agriculture*, Proceedings of an IBSRAM Inaugural Workshop, pp.65-107.

[15] Interview by telephone with Thomas J. Smyth, Department of Soil Science, University of North Carolina, September 13, 1994. Smyth has done work in Brazil, Guatemala, and the Amazon side of Peru.

[16] Huston, Michael, "Biological Diversity, Soils and Economics," *Science*, December 10, 1993, pp.1676-1680.

[17] A logical explanation as to why the ancient Mayas devoted so much effort to developing an accurate calendar would be their need to determine when the rains would start and thus the time to plant corn.

[18] Cummings, Ronald G., *et al*., "Waterworks: