

May Day: Fertility and Population

Holley Ulbrich

Senior Scholar, Strom Thurmond Institute

This article is the sixteenth in a year-long series about economics and holidays.

May 1st marks an ancient Northern European festival called Beltain, which celebrates the fertility of the earth and its inhabitants as spring begins to blossom into summer. The maypole is a remnant of that festival. May Day is also an international labor day (but not in the United States), but the holiday we reflect on here is the fertility festival.

Fertility of the earth is generally regarded as a good thing. Fertility of humans, maybe not so much. Economist Julian Simon argued in his book *The Ultimate Resource*¹ that producing more people would expand a productive resource that would contribute to output and growth. Critics, including entomologist Paul Ehrlich, author of *The Population Bomb*², were alarmed at the possible catastrophic consequences of unchecked human population growth on a planet of finite size and carrying capacity.

The argument over population growth dates back at least to British parson and economist Thomas Robert Malthus, who argued that human population grows geometrically (2,4,8,16,...) while the food supply grows arithmetically (1,2, 3, 4, 5...). Why did the food supply grow more slowly? Diminishing returns. As more seeds, fertilizer, tractors, and workers are applied to a limited or fixed supply of arable land, the additional output will grow more and more slowly in response to each increase in inputs. If not, Malthus observed—if we could continue to increase output by applying more and more non-land resources to a fixed supply of land—then theoretically we could feed the world out of a flowerpot!

Diminishing returns—successively smaller increases in output per unit of additional input—has many applications in economics, although this one is the most famous. Adding more and more workers to a factory without increasing the scale of the plant will eventually so crowd the workplace that it is difficult to move, let alone produce. Long before that point, however, the additional worker may still increase output, but not by as much as previous additions to the workforce because of limits on the availability of tools, machines, and other complementary resources. In the absence of dramatic technological change, Malthus argued, population growth would be checked by famine and starvation and disease unless people could be persuaded to take steps to control their fertility. One prescription for this dismal projection is population control, either voluntary or (in the case of China) mandatory. Newer methods of birth control have made it easier for families to limit the number of children they have. In fact, fertility rates have dropped below the replacement level in some countries, particularly Russia.

The other possibility is to increase output so as to provide for the additional guests at the table. Technological change, especially in food production, has negated or at least forestalled some of the

¹ Simon, Julian, *The Ultimate Resource* (Princeton University Press, 1983).

² Ehrlich, Paul, *The Population Bomb* (Ballantine Books, 1971).

more dire predictions of collapse. The Green Revolution, for example, led to large increases in agricultural productivity in the 1970s, although agronomists are now observing that many of these gains in output were at the cost of sustainability. The new varieties of staple crops are more dependent on petroleum based fertilizer, large scale production, and pesticides than some of the older varieties grown by peasant farmers on small plots for centuries. The loss of plant species diversity also makes crops more vulnerable to insect pests and disease.

The argument over increasing the food supply versus controlling population is one that is not easily resolved, because both positions are rooted in particular economic ideologies that offer differing interpretations of the facts. The facts include not just the successes and shortcomings of the Green Revolution but also the realities of climate change, soil erosion, water shortages, and other limitations as well as the potential for further technological innovations that will enable us to transcend those limitations. The neoconservative position, dominant among contemporary economists, is that a combination of technological improvements and market forces will enable humans not only to limit population growth but also to expand the availability of potable water, food, and other resources to meet the needs of all without dramatic change or significant government intervention. They point to declines in fertility that occurred in the industrial world as first the death rate fell with improved sanitation, nutrition and health care, and then the birth rate as families no longer needed such a large number of children to work the farm and support them in their old age.

The alternative world view, expressed most notably in *The Limits to Growth*,³ is skeptical about the potential for technological change and voluntary population control to offset the reality of finite resources in the absence of government intervention. The market is not always the most effective tool for addressing the need for concerted or coordinated action. Population growth generates externalities. In a young, underpopulated country, those externalities are positive. There will be a critical mass of workers for using more labor-intensive methods of production and an adequate market to support the production and sale of goods and services that have economies of scale. There will be more opportunities to specialize, which increase efficiency. But as population reaches a certain size, negative externalities begin to appear, including noise, crowding, and growing shortages of certain kinds of essential resources such as potable water, fossil-fuel based energy, clean air, and arable land. The market solution of rising prices leaves those at the bottom of the income distribution to fend for themselves in an increasingly Malthusian world.

Which view of human population growth is correct? Only time will tell.

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³ Meadows, Donella *et.al.*, *The Limits To Growth* (Signet, 1972). An update, called *Limits to Growth: The 30-Year Update* (Chelsea Green Publishers) was published in 2004.