Population Growth

When the population of the world over the past three millenniums is graphed, it is apparent the majority of its growth has occurred in a brief 200 year span.

The world population reached:

- 1,000,000,000 in 1804
- 2,000,000,000 in 1927
- 3,000,000,000 in 1960
- 4,000,000,000 in 1974
- 5,000,000,000 in 1987
- 6,000,000,000 in 1999

Note that it took about 123 years for the world human population to go from 1 billion to 2 billion --- from about 1804 to about 1927. But nowadays, in the 1950 to 2050 timeframe, we are adding about a billion people every dozen years --- that is, about 10 times faster than only a couple of hundred years ago. That little dip, around 1400, when the plague occurred, was a huge thing at the time. But, in terms of population impact, from the point of view of someone looking back from the current vantage point, about 600 years later, the plague did not slow down human population growth much at all.
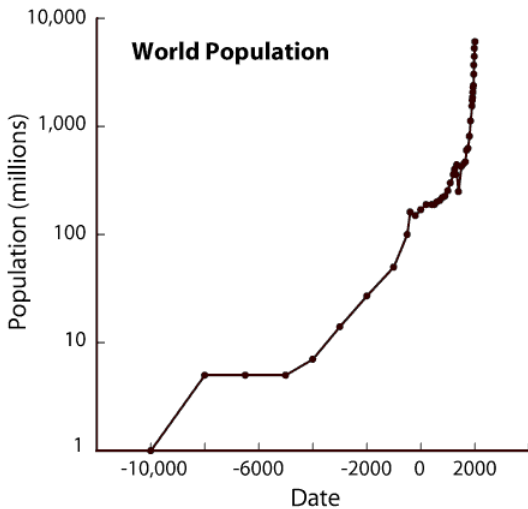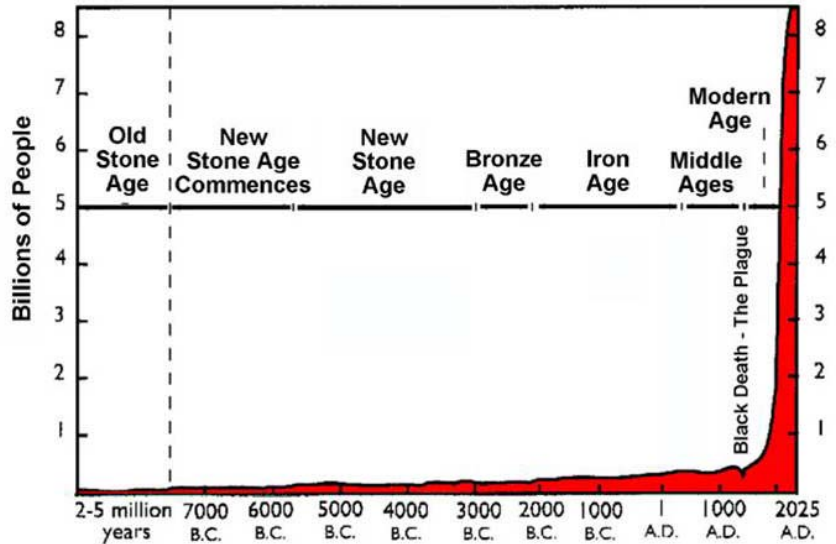
If you took some high school algebra, you may remember that if we plot data points that represent exponential growth on a 'logarithmic y scale', the 'log plot' curve should look like a straight line. However if you plot human population growth in a 'log plot', you will see that human population is still growing above a straight line that you would draw through data points from about 1000 B.C. to about 1000 A.D. See the log-plot graph below. In words, human population on Earth is growing much faster than exponentially. Most humans do not seem to be aware of the implications of this accelerating human population growth - namely,

- more wars - over resources such as food, water, fuel, minerals
- wiping out many forms of animal life - not only species that man does not directly need for survival (tigers, lions, elephants, rhinos, crocodiles, etc.), but also food-fuel-lubricant species such as fish, shellfish, whales, etc.
- wiping out plants - forests and brushland that we need for oxygen as well as for fuel and paper and chemicals and pharmaceuticals
- more disease - not only because of sewage disposal issues, but also closer proximity and more contact
- atmospheric pollution - air and temperature
- water pollution

Thomas Robert Malthus

In 1798, demographer Thomas Robert Malthus published his views about population in the first of six editions of his book *An Essay on the Principle of Population*. Malthus felt that if the world's population were left unchecked, it would rise sharply (exponentially) and would eventually surpass the ability of the earth to support itself. He suggested that controls on the population such as war, famine, and disease would provide the restrictions necessary to limit growth.
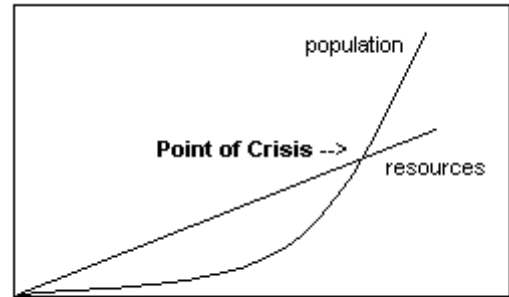
Malthus' Basic Theory

Since 1800, global food production has generally kept pace with world population growth. In 1798, Malthus stated that _____ _____ _____.

Malthus was alive and working when England instituted the Poor Relief Bills that were designed to

_____ _____ _____.

Malthus theorized that there are 2 ways or "checks" to help slow population growth:

1) _____
_____
2) _____
_____
_____

However, Malthus didn't take into account _____ _____ _____ _____

Populations Controls Today

China _____ _____ _____ _____

Czech Republic _____ _____ _____ _____

The Demographic Transition Model

	Phase 1	Phase 2	Phase3	Phase 4	Phase 5
	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____

Birth
and
Death
Rates
per
1000

50

40

30

20

10

Time →