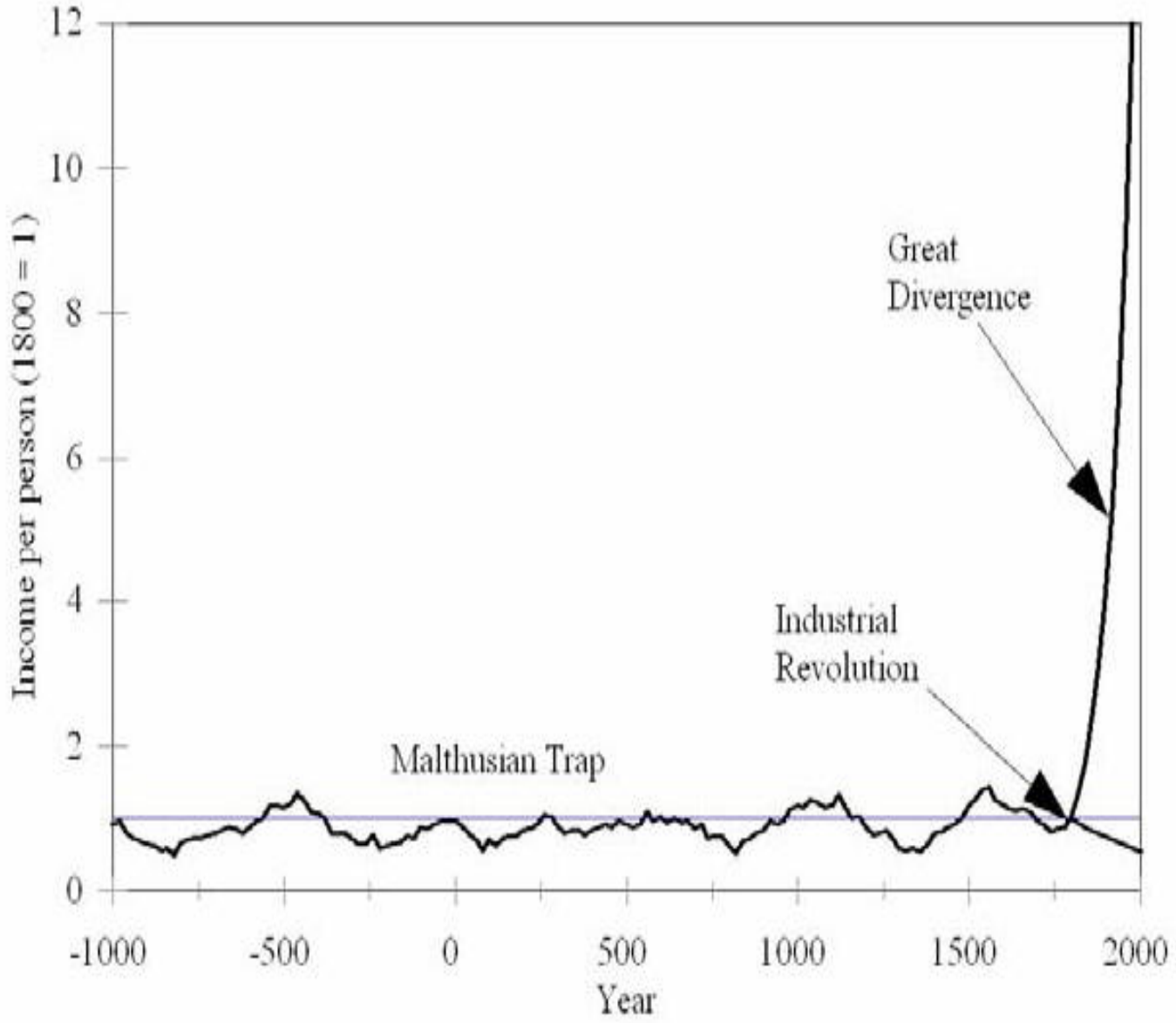
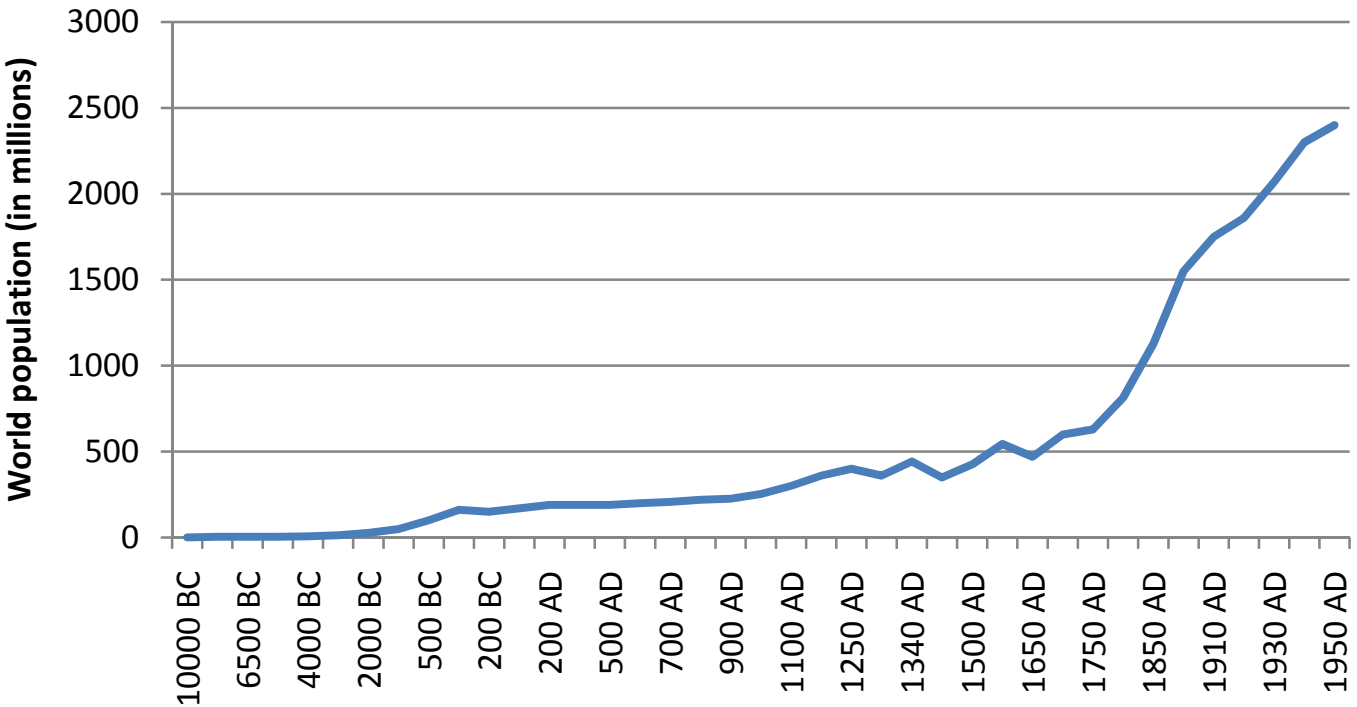
The Economic History of the World



A Brief Population History of the World



Population in the Preindustrial World

Location	Population in 1300	Population in 1800	Surviving children per woman
Norway	0.4	0.88	2.095
Southern Italy	4.75	7.9	2.061
France	17	27.2	2.056
England	5.8	8.7	2.049
Northern Italy	7.75	10.2	2.033
Iceland	0.084	0.047	1.93

Explaining Stationary Populations

- One of the key differences between the preindustrial world and the modern world was that population size was pretty much static
- It turns out that there is a very simple economic argument for why this was the case, the Malthusian trap
- The argument depends on three assumptions about how preindustrial economies worked:
  - Each society had a birth rate increasing with living standards
  - Each society had a death rate decreasing with living standards
  - Living standards decline as population increases

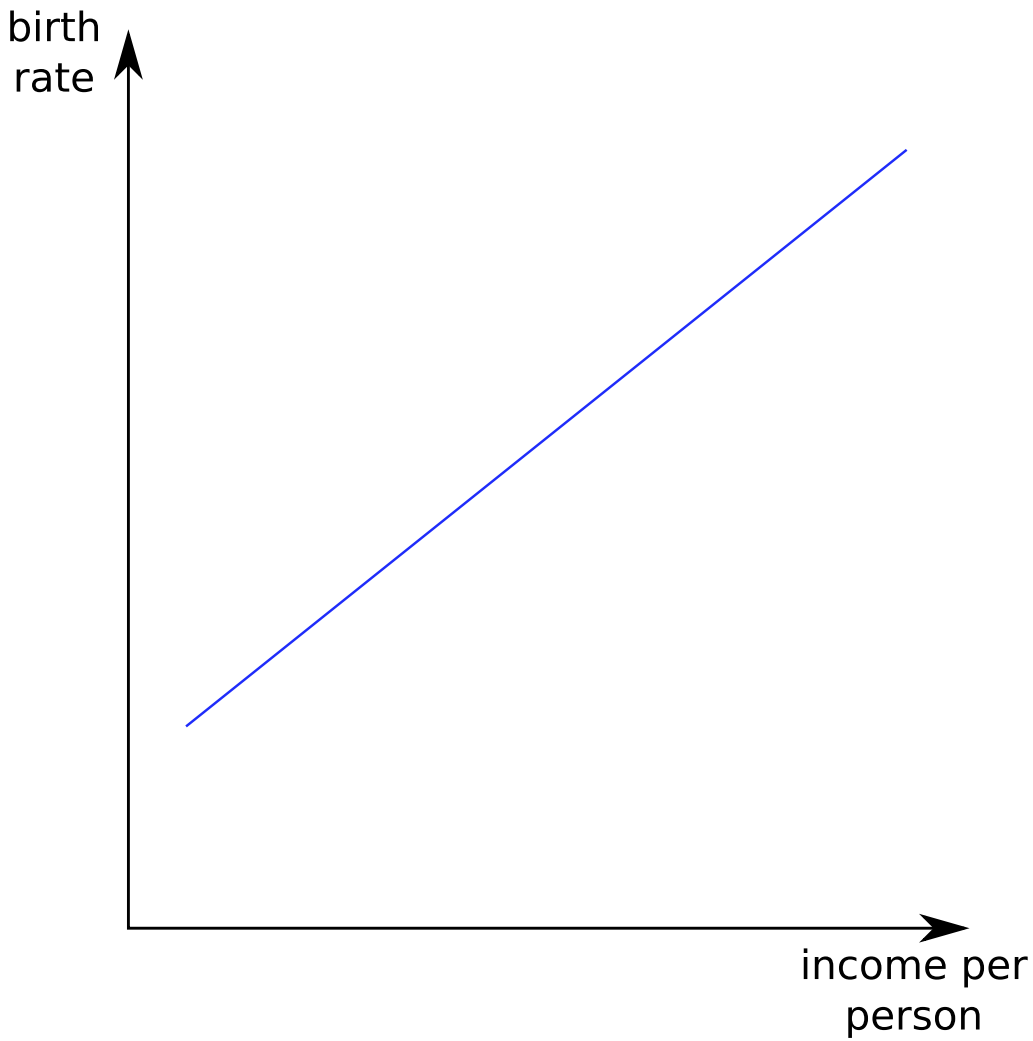
The Birth Rate Schedule

- The birth rate is just the number of births per year per thousand people
- For example, there were 4,059,000 births in the United States in 2000 and the US population was 281,421,906:

$$b_{2000} = \frac{4059000}{\frac{281421906}{1000}} = 14.4$$

- We assume that in the preindustrial world, birth rates rose with material living standards
- Why? A wealthier family could better afford an additional child, a healthier woman was more likely to have a successful pregnancy, ...

The Birth Rate Schedule



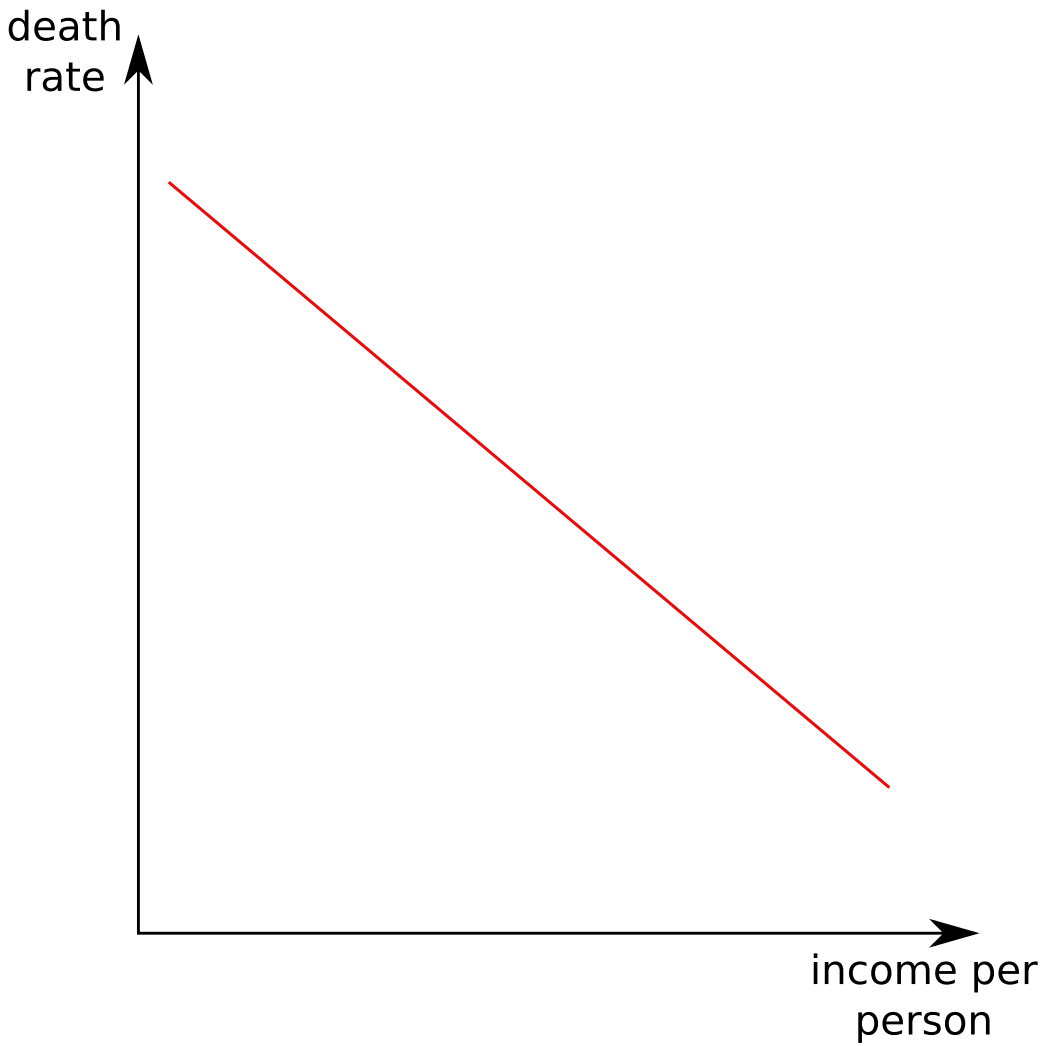
The Death Rate Schedule

- The death rate is just the number of deaths per year per thousand people
- For example, there were 2,403,000 deaths in the United States in 2000 and the US population was 281,421,906:

$$d_{2000} = \frac{2403000}{\frac{281421906}{1000}} = 8.5$$

- We assume that in the preindustrial world, death rates fell with material living standards
- Why? Higher levels of consumption (better food, clothing, shelter, etc.) helps you live longer

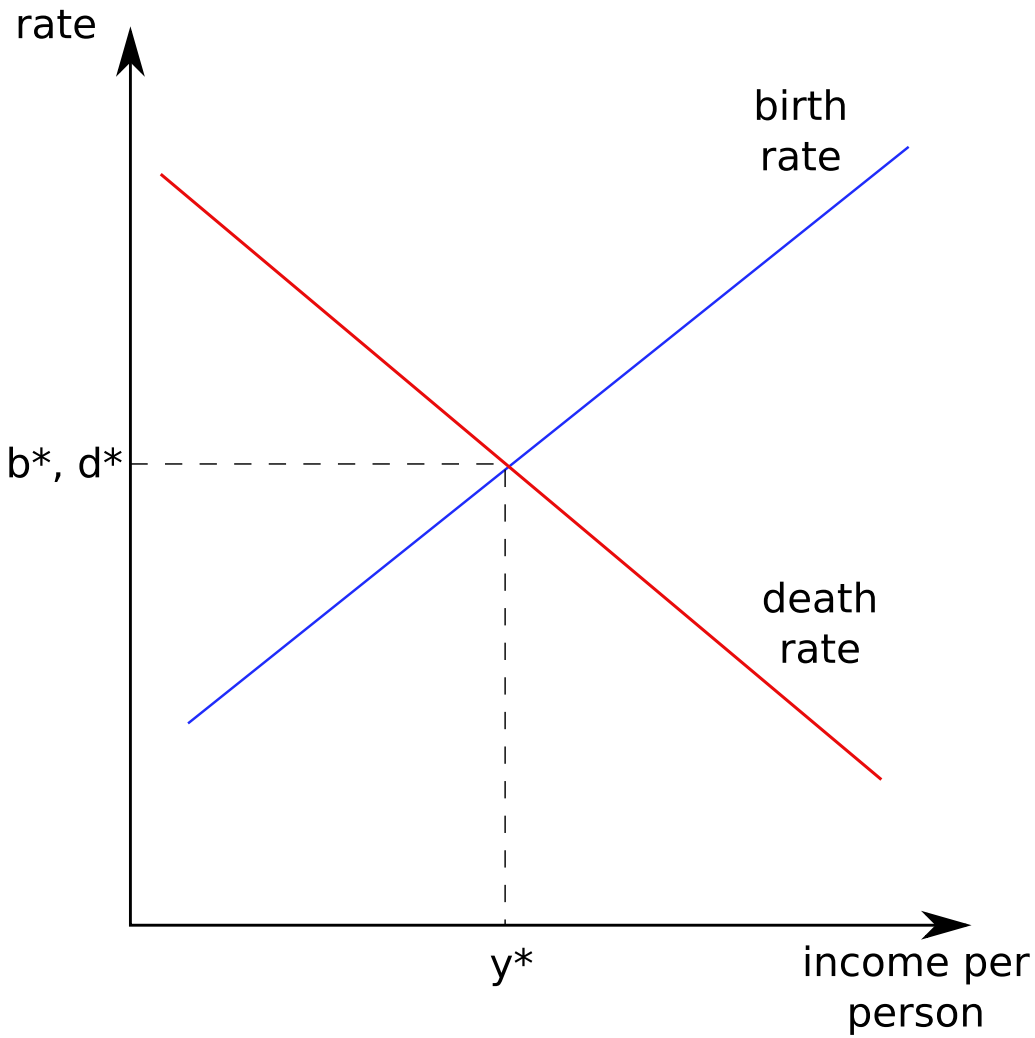
The Death Rate Schedule



Stationary Population

- Notice that for our US figures, the birth rate was 14.4 births per 1,000 people per year and the death rate was 8.5 deaths per 1,000 people per year
- This means that each year, more people are being born than are dying so population must be growing
- Recall that the preindustrial world had almost no population growth
- So in the preindustrial world, the birth rate roughly equaled the death rate (the income per person at which this occurs is called the *subsistence income*)

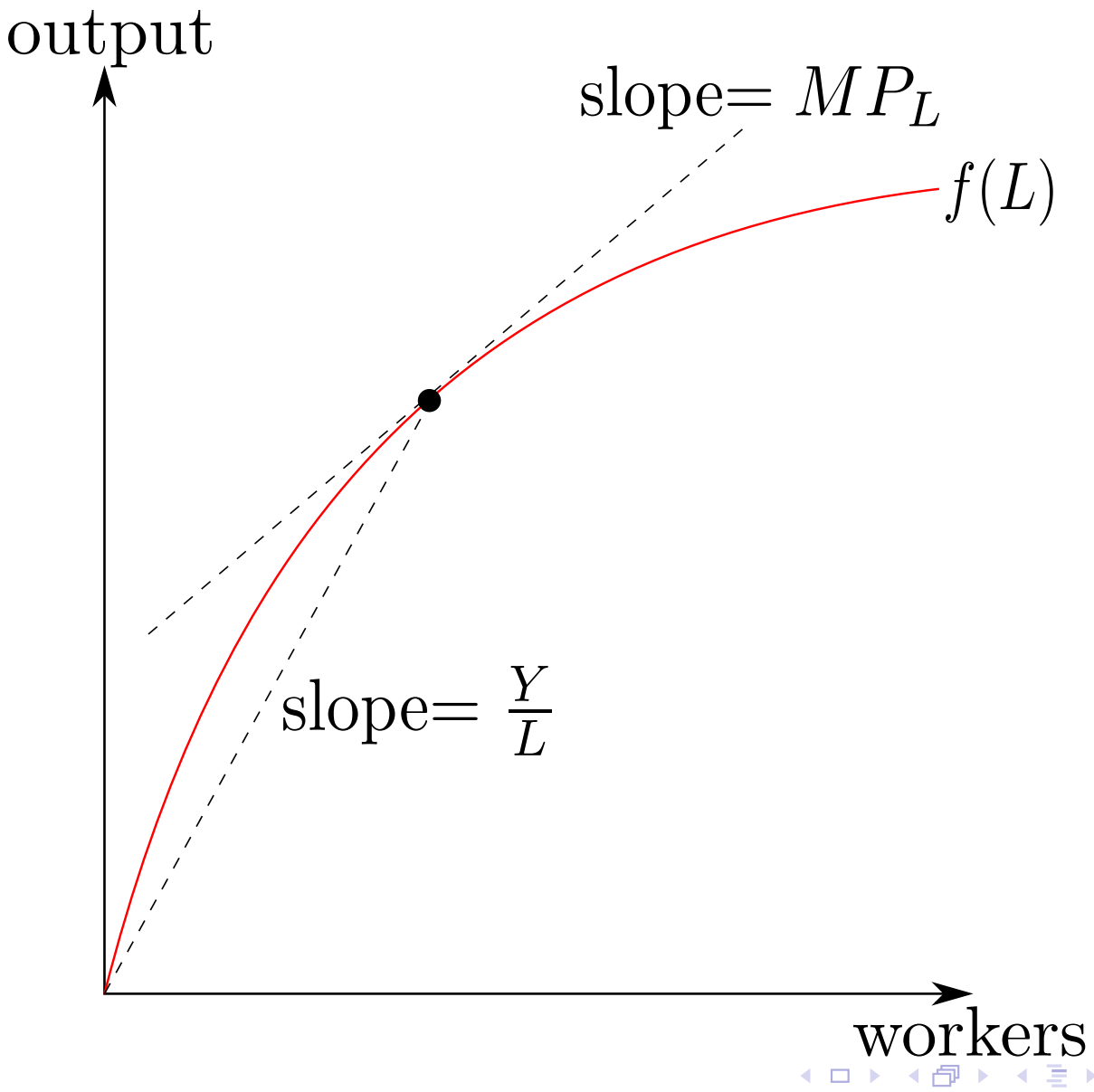
Stationary Population



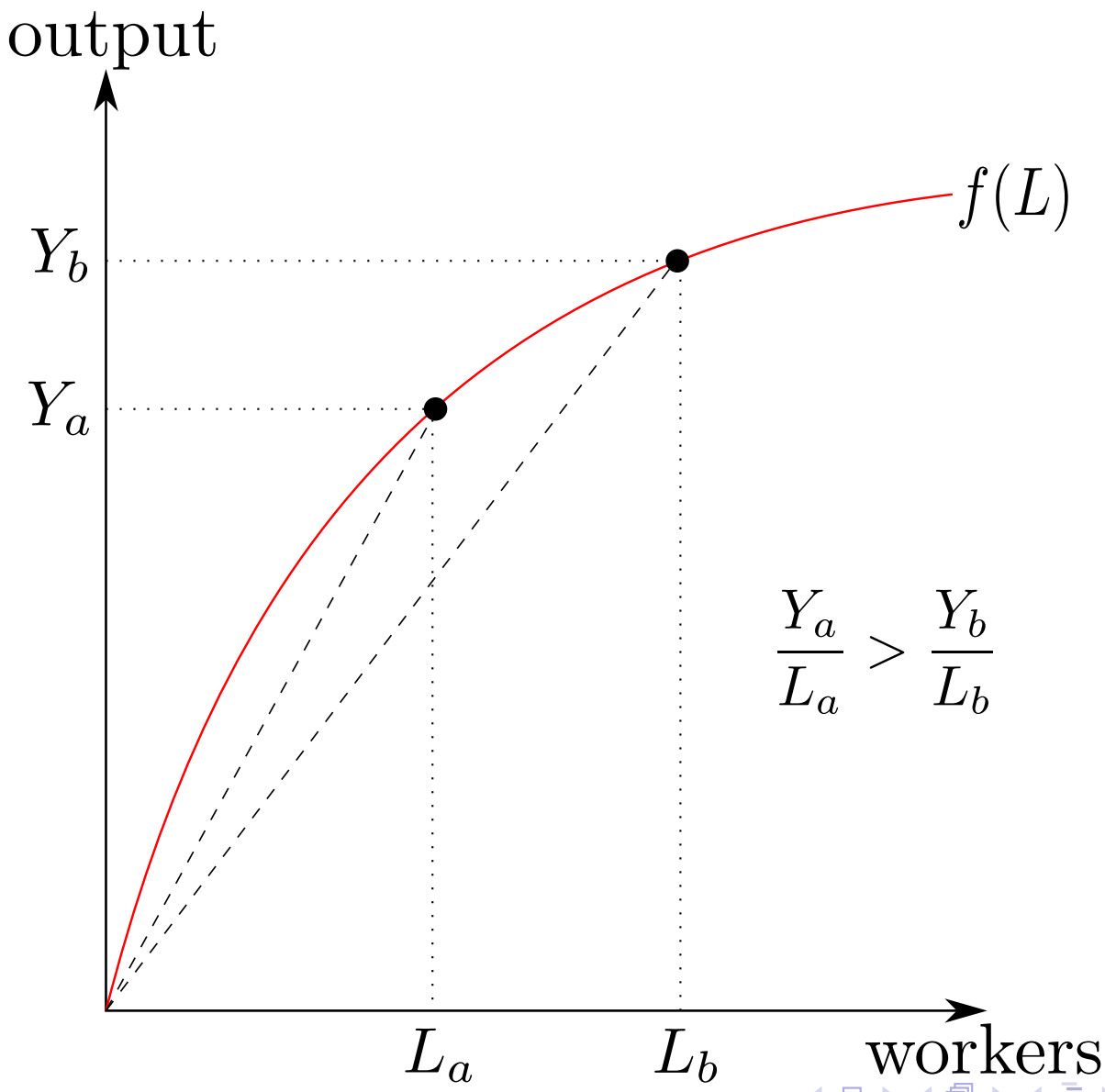
Stationary Population

- But why a stationary population?
- Because of the technology curve relating population to income per person
- With some resources fixed (for example land), the marginal product of an extra person is positive but smaller than the marginal product of the previous person
- This means that while total output increases as population increases, it increases at a slower rate than population

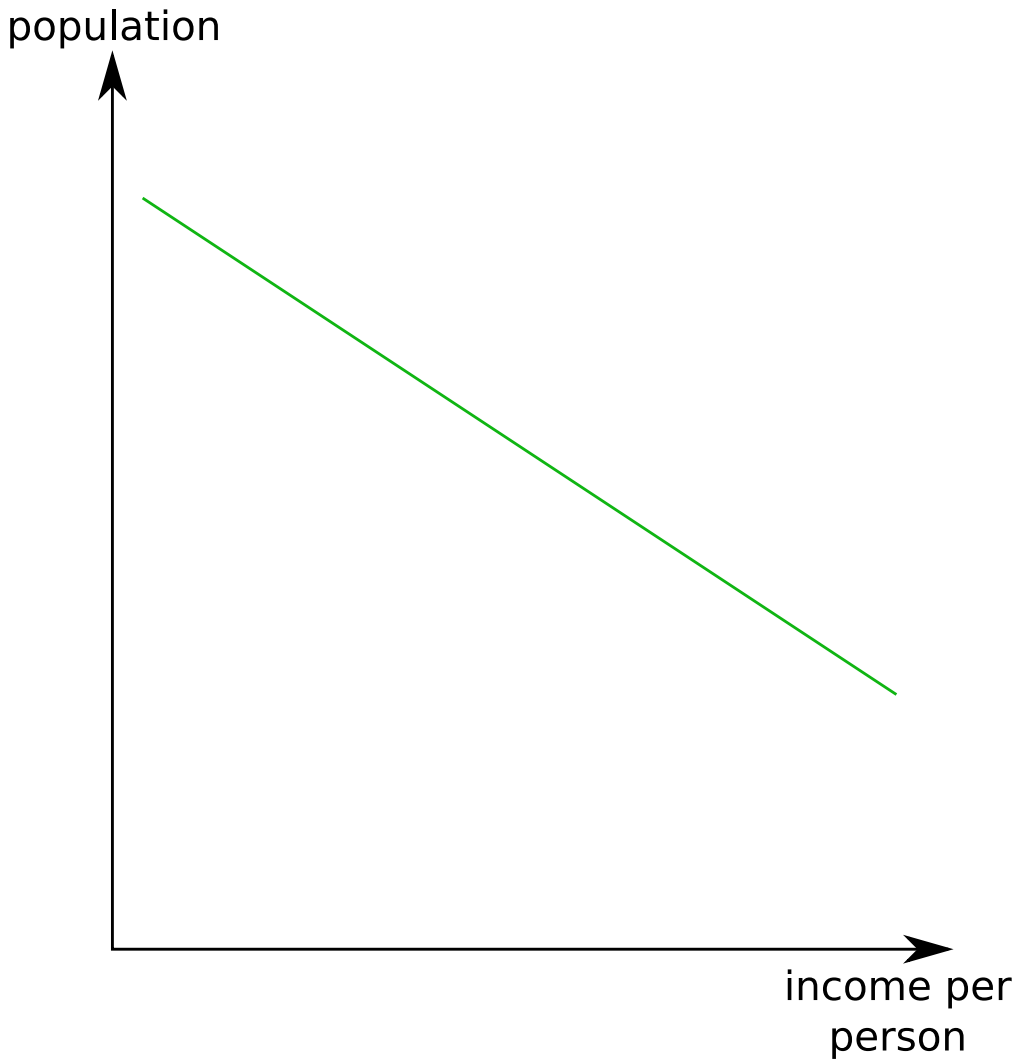
Diminishing Marginal Product and the Malthusian Trap



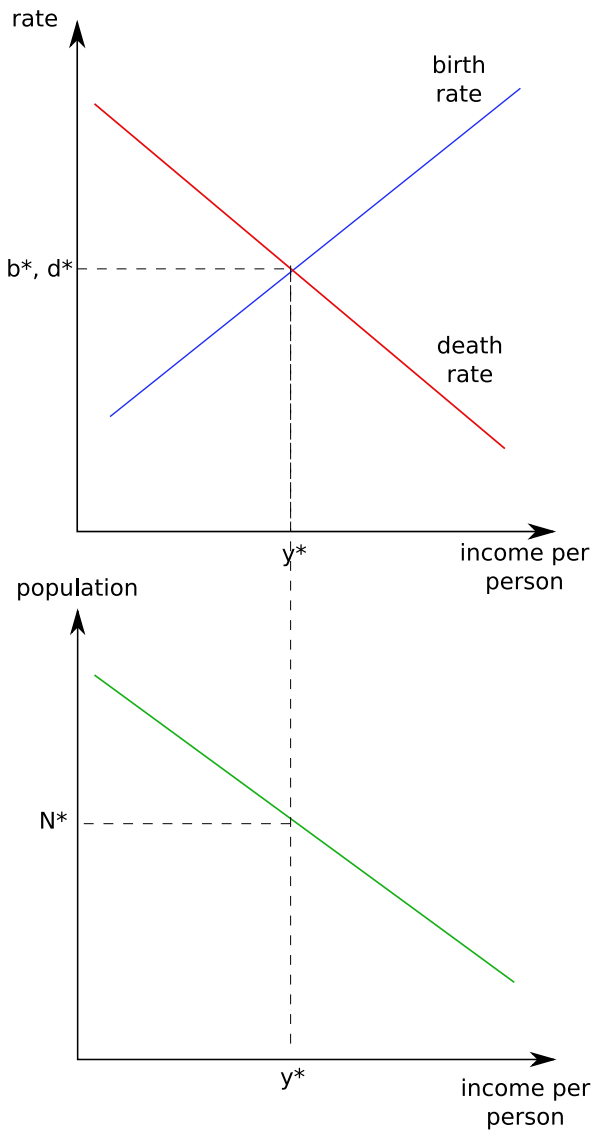
Diminishing Marginal Product and the Malthusian Trap



The Technology Curve



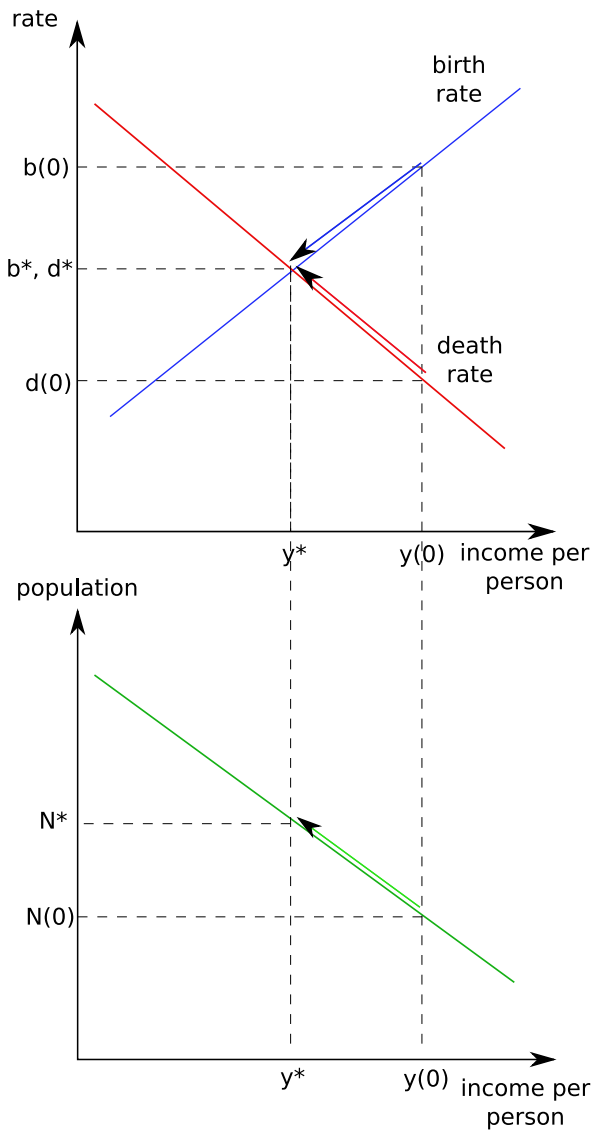
The Malthusian Equilibrium



Moving to the Malthusian Equilibrium

- Suppose we were at an income per person greater than the equilibrium level
- Then births would exceed deaths leading to population growth
- As the population grows, we move up and to the left along the technology curve
- This leads to lower income per person increasing the death rate and decreasing the birth rate
- Things stop moving once the birth rate equals the death rate

Moving to the Malthusian Equilibrium



Moving to the Malthusian Equilibrium

- Notice that equilibrium income per person had nothing to do with the level of technology
- Equilibrium income per person is determined entirely by the birth rate and death rate
- The technology curve mattered for two reasons:
  - The downward slope told us how income per person would change if the population was growing or shrinking
  - The position determined the equilibrium population level

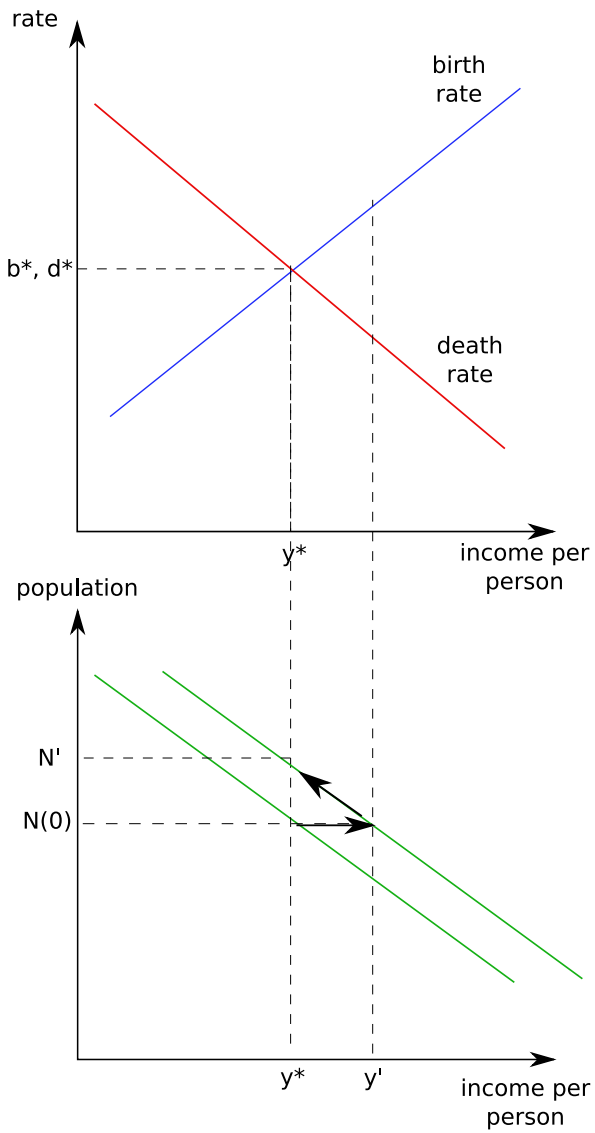
The Effects of a Change in Technology

Suppose that there is an improvement in technology (we invent the wheel). What happens?

- The advance in technology will shift the technology curve to the right
- In the short run (before population adjusts), this means greater income per person
- Births will rise, deaths will fall and the population will grow
- The economy returns to the old income per person only at a new higher population

So an improvement in technology can allow for greater population density but doesn't improve average income per person

The Effects of a Change in Technology

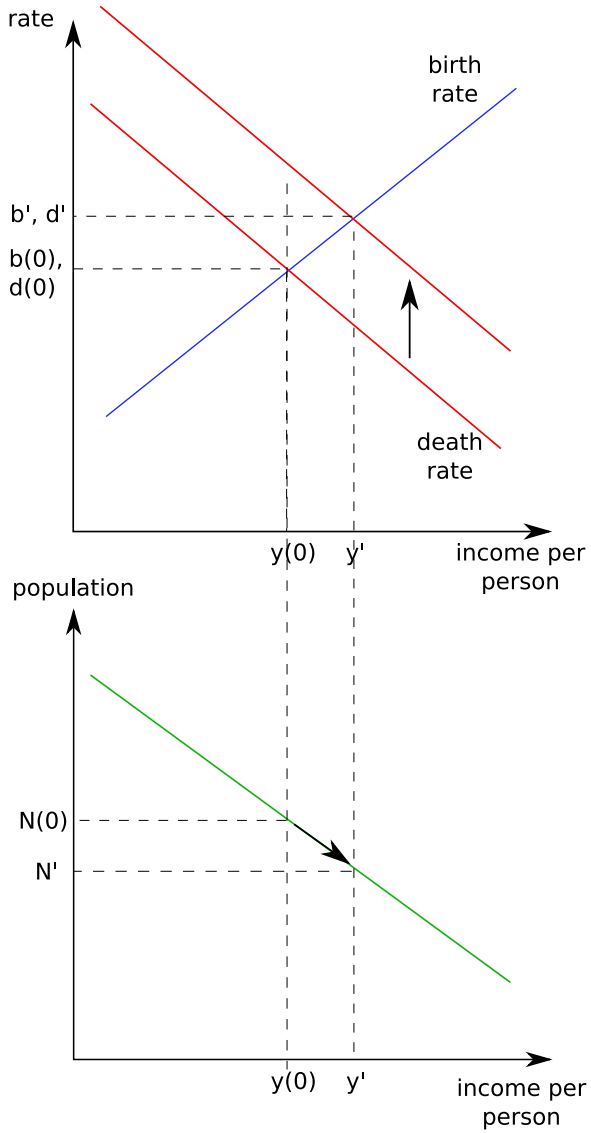


The Effects of a Change in the Birth or Death Schedules

A shift in the birth or death schedules can change equilibrium income per person. Suppose that the plague comes along, what happens?

- The rise in disease will shift the death rate curve up (more deaths at any given income level)
- At the current income per person, deaths will now outnumber births and the population will decrease
- As the population decreases, income per person will rise until deaths once again equal births
- The economy settles at a new higher income per person and a new lower population

A Shift in the Death Rate Curve



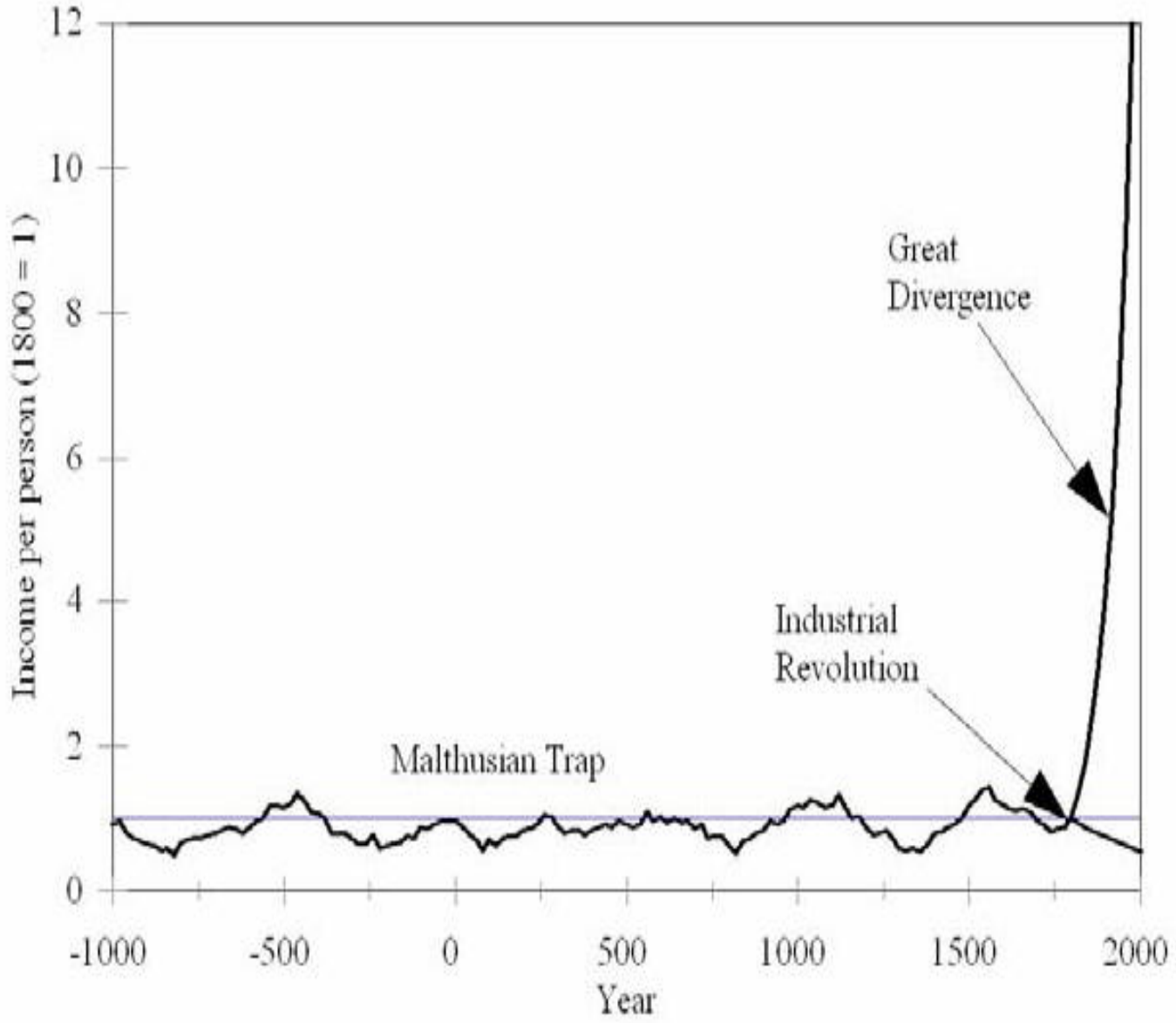
Change in the Malthusian World

- The birth and death rate curves determine the subsistence income
- The technology curve determines the population size based on this subsistence income
- A change in technology can lead to a different population size in the long run but not a different subsistence income
- A change in the birth rate or death rate curve is the only way to change the long run subsistence income

The Economic State of the World in 1600

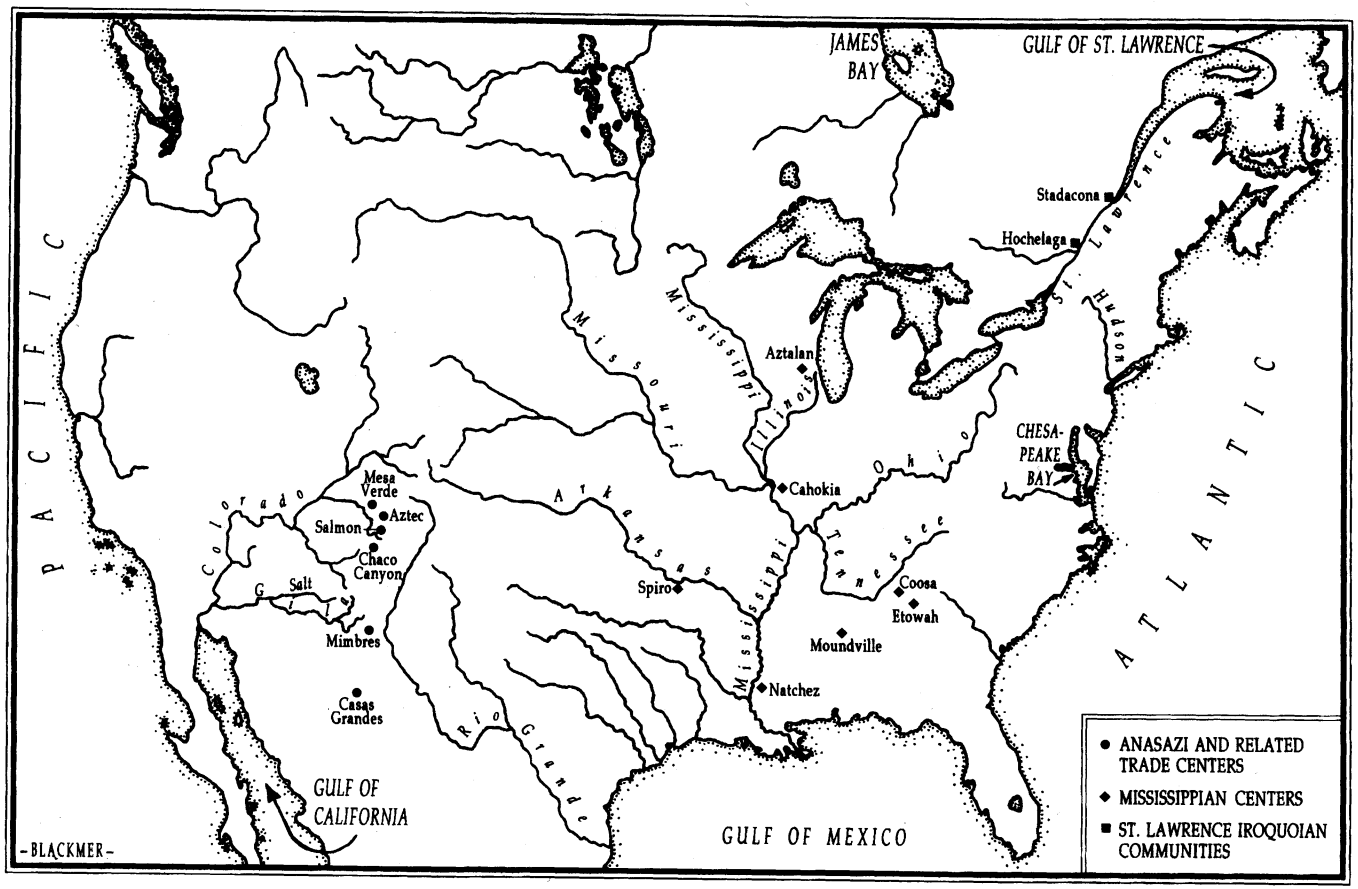
- So this is the world in which the American economy will gets its start
- Economies are constrained by this Malthusian trap
- These Malthusian forces limit population growth and gains in income per person
- We are essentially going to trace America's emergence out of this world into our modern world of steady population and income growth

The Beginnings of the American Economy



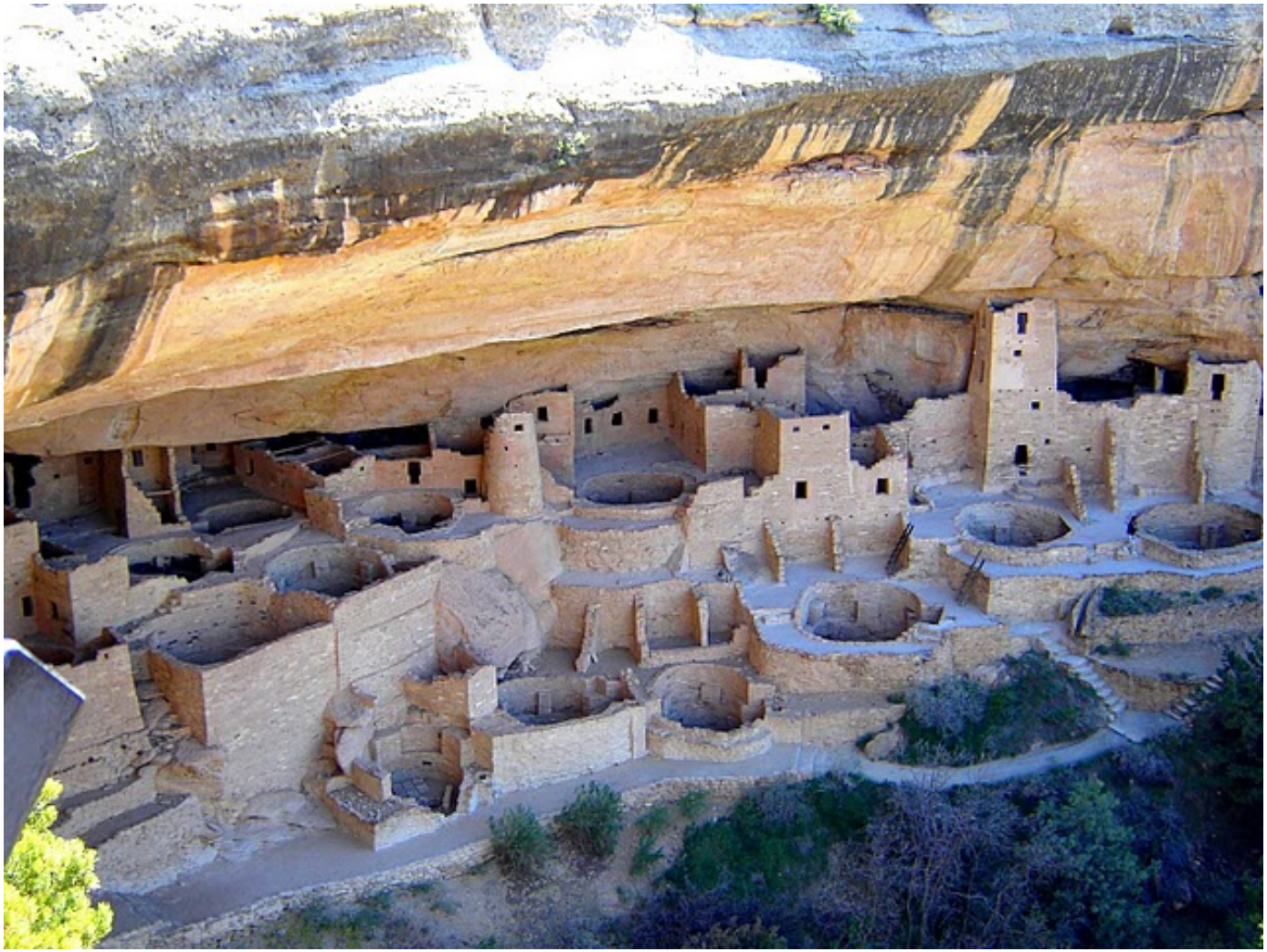
The Precolonial Economy

Selected Native American centers in North America, ca. 1250.



From "The Indians' Old World" by Neil Salisbury, William and Mary Quarterly, Vol. 53, No. 3, 1996

The Precolonial Economy



Anasazi (circa 1200 AD) ruins in Mesa Verde National Park

The Precolonial Economy

Historical city populations in North America and Europe

City	Time Period	Population
Cahokia (Mississippian)	12th century	20,000
Chaco Canyon (Anasazi)	12th century	15,000
London	1100	25,000
Paris	1150	50,000
Rome	1100	35,000

Chandler, Tertius, Four Thousand Years of Urban Growth, 1987.

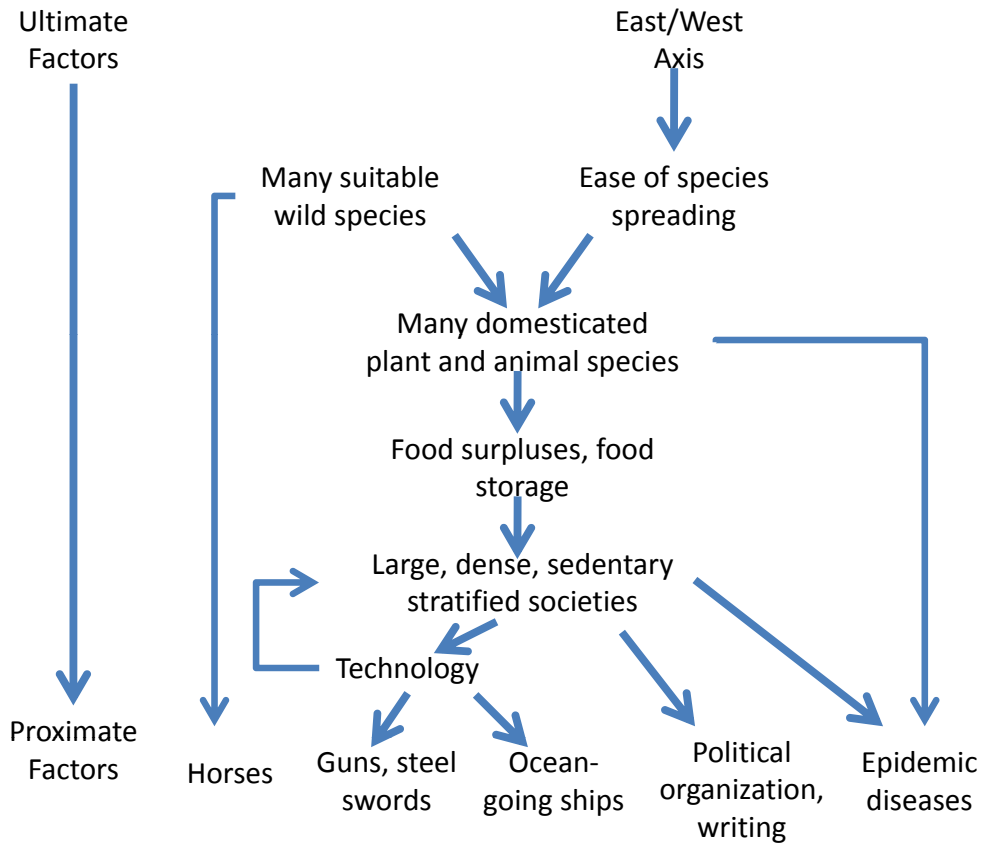
Why Do We Speak English?

- Europeans didn't arrive to an empty continent
- Relatively large population centers existed
- Economies had evolved to include complex political structures, agriculture, division of labor, trade over long distances, etc.
- So why are we an English speaking country today?

Why Do We Speak English?

- Salisbury touches on this, emphasizing ecological crises
- This is essentially an argument about a Malthusian trap of the sort we have discussed
- But Europe had similar issues of a Malthusian trap
- What differences led to Europeans being able to take control of North America?

Guns, Germs, and Steel



Theory proposed by Jared Diamond in "Guns, Germs, and Steel"

Guns, Germs, and Steel

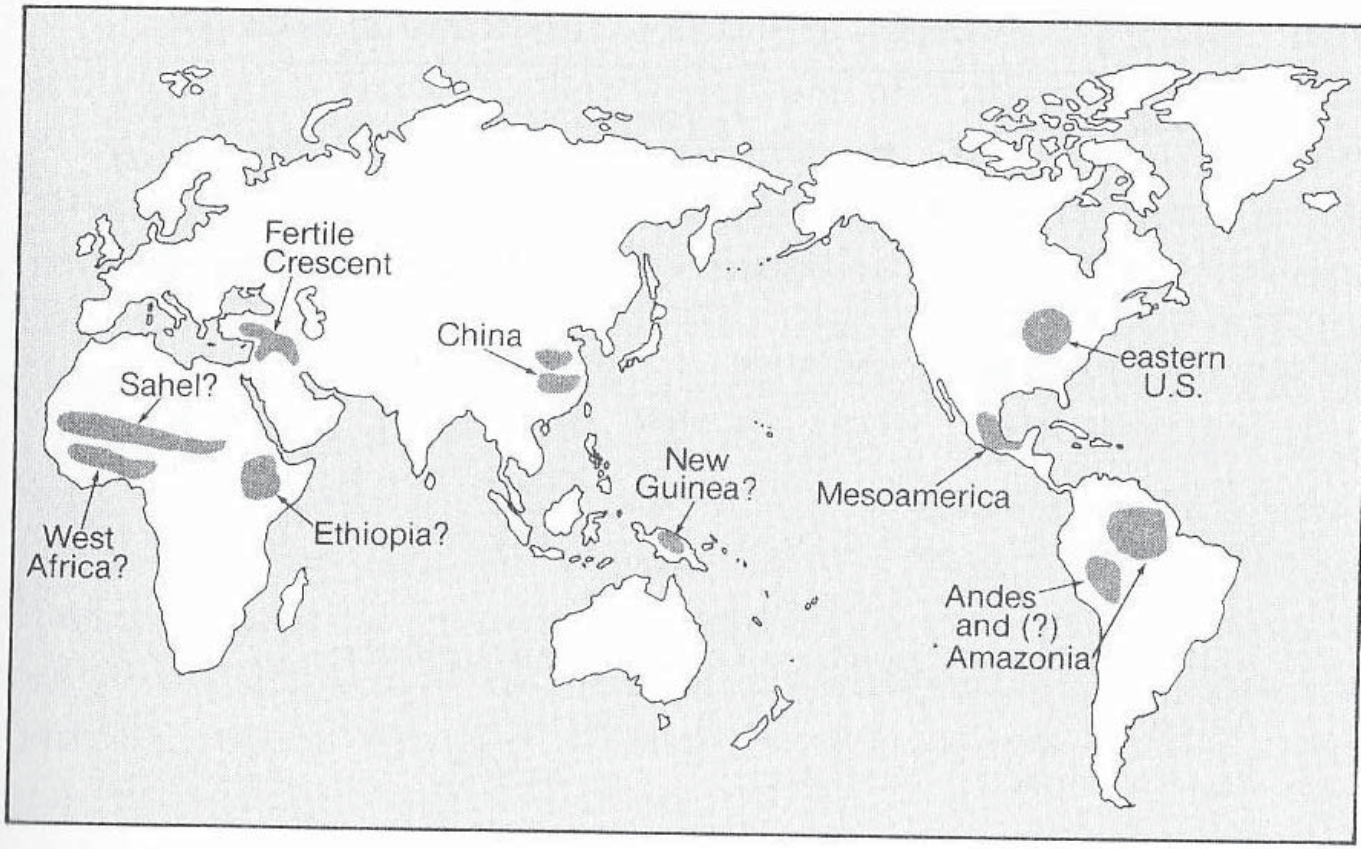


Figure 5.1. Centers of origin of food production. A question mark indicates some uncertainty whether the rise of food production at that center was really uninfluenced by the spread of food production from other centers, or (in the case of New Guinea) what the earliest crops were.

From Jared Diamond, "Guns, Germs, and Steel", 1997

Guns, Germs, and Steel

Mammalian Candidates for Domestication

	Eurasia	Sub-Saharan Africa	The Americas	Australia
Candidates	72	51	24	1
Domesticated species	13	0	1	0
Percentage of candidates domesticated	18%	0%	4%	0%

Candidate is defined as a species of terrestrial, herbivorous or omnivorous, wild mammal weighing over 100 pounds.

The Major Five

Domesticated animal	Location of wild ancestor
Sheep	West and Central Asia
Goat	West Asia
Cow	Eurasia and North Africa
Pig	Eurasia and North Africa
Horse	Russia

Guns, Germs, and Steel

The Minor Nine

Domesticated animal	Location of wild ancestor
Arabian camel	Arabia
Bactrian camel	Central Asia
Llama and alpaca	Andes
Donkey	North Africa (maybe Southwest Asia)
Reindeer	Eurasia
Water buffalo	Southeast Asia
Yak	Himalayas
Bali cattle	Southeast Asia
Mithan	India

Guns, Germs, and Steel

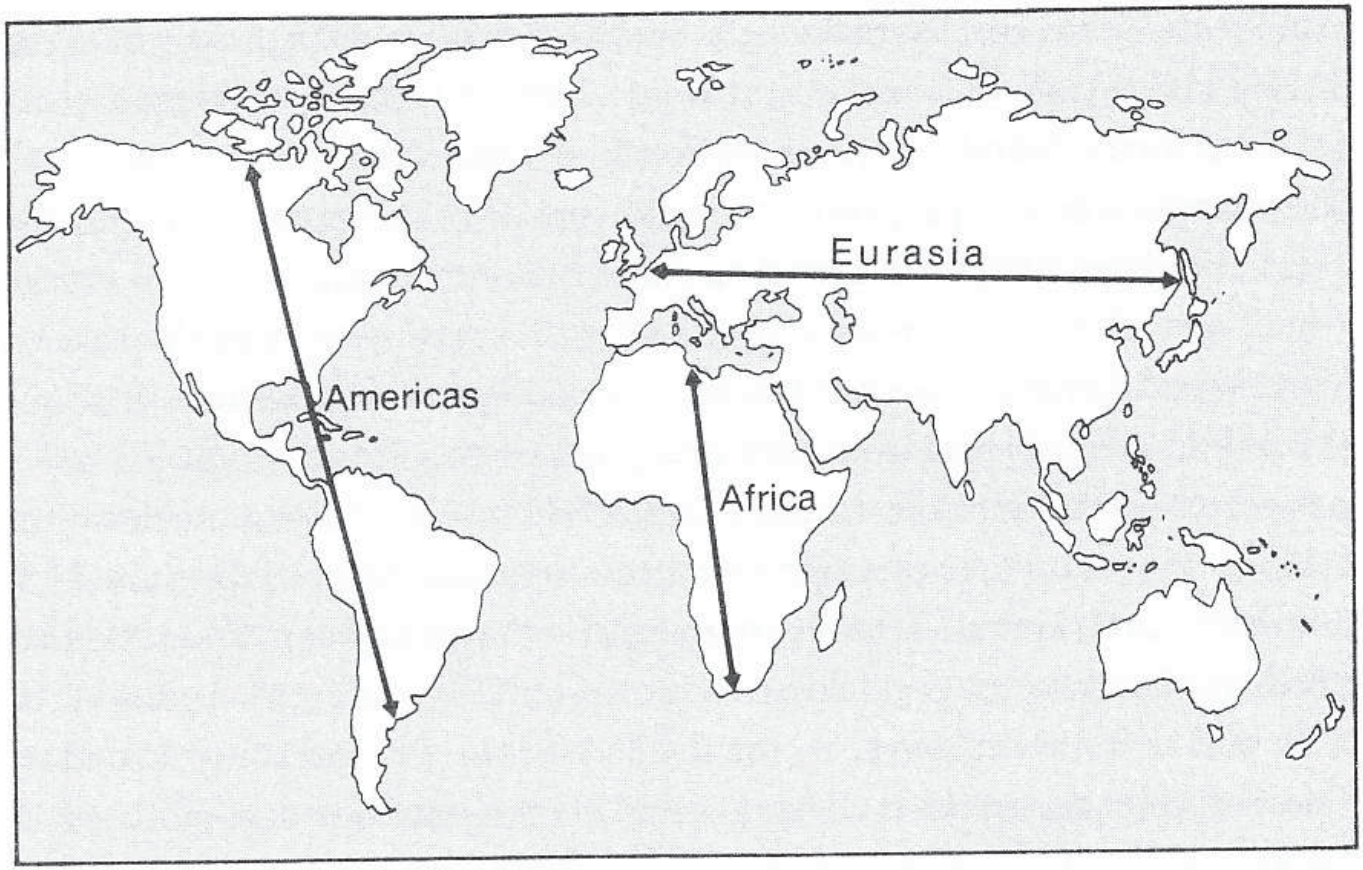


Figure 10.1. Major axes of the continents.

From Jared Diamond, "Guns, Germs, and Steel", 1997