HOW POPULATIONS GROW

Chapter
5-1

GOES 8
September 1994

I. Characteristics of Populations

A. Geographic Distribution = Area inhabited by a population

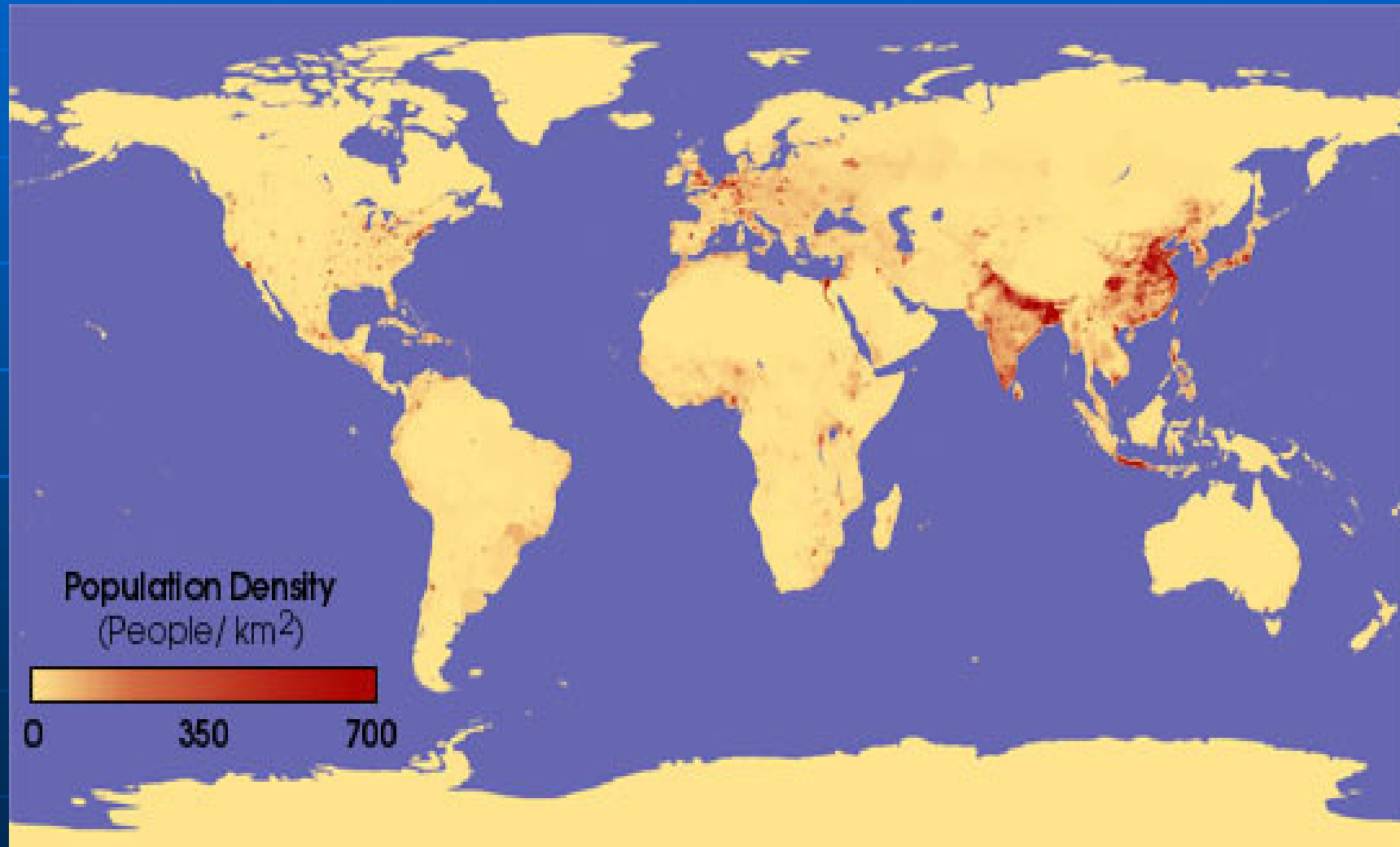**B. Density** = The # of individuals per unit area

C. Growth rate = Rate at which a population changes size

D. Age structure = Different ages of the organisms in a population

II. Population Density

- The number of individuals per unit area

Population Density
(People / km²)

0   350   700

II. Population Density

Example:

A. Cactus: low #'s

   Low density

B. Shrubs: higher #'s

   High density

III. Population Growth
Factors that affect population size:

A. Birth Rate   **=the amount of births**

B. Death Rate   **=the amount of deaths**

C. Immigration   **=moving into an area**

D. Emigration   **=moving out of an area**

IV. How is the Population Affected?
Increase or Decrease

A. ↓ birth rate & ↑ death rate =Decrease

B. ↑ birth rate & ↓ death rate =Increase

C. ↓ immigrants & ↑ emigrants =Decrease

D. ↑ immigrants & ↓ emigrants =Increase
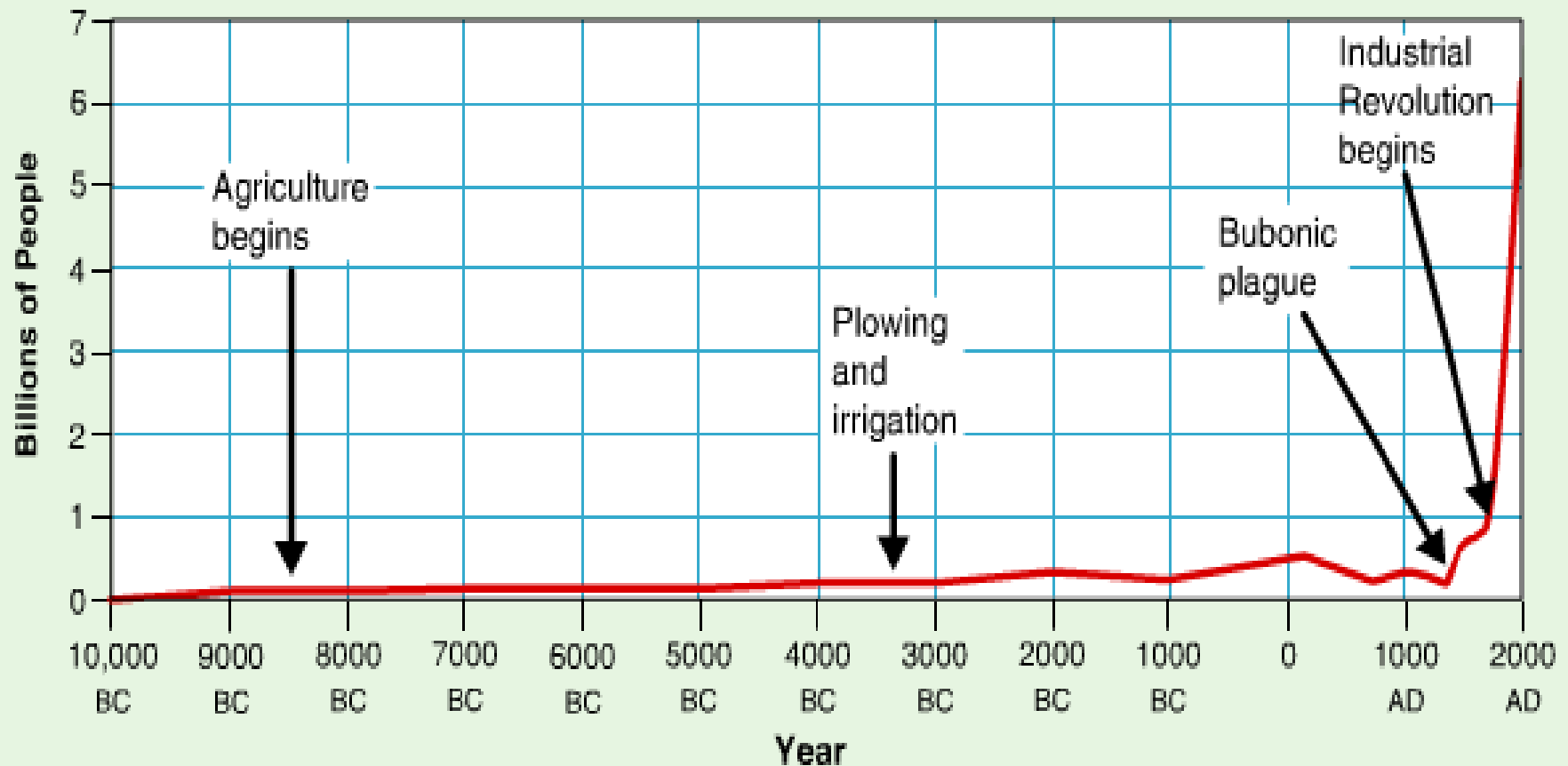
V. Exponential Growth

A. Will occur under IDEAL conditions like:

    1. unlimited resources

    2. no predators

    3. no disease

    4. plenty of space

B. Produces a J – shaped Curve when graphed

Human Population Growth

Human Population Growth 🌏 **The size of the human population has increased over time.** After a long, slow start, the worldwide population grew exponentially following improvements in medicine, sanitation, agriculture, energy use, and technology.

VI. Logistic Growth
S- Curve

A. In ecosystems where:

   1. Resources are limited

   2. Predators exist

   3. Disease exists

   4. Lack of space

B. Occurs when the carrying capacity of an ecosystem

   has been reached.

C. Carrying capacity= when a population's growth slows or stops. (not increasing or decreasing, leveled off)
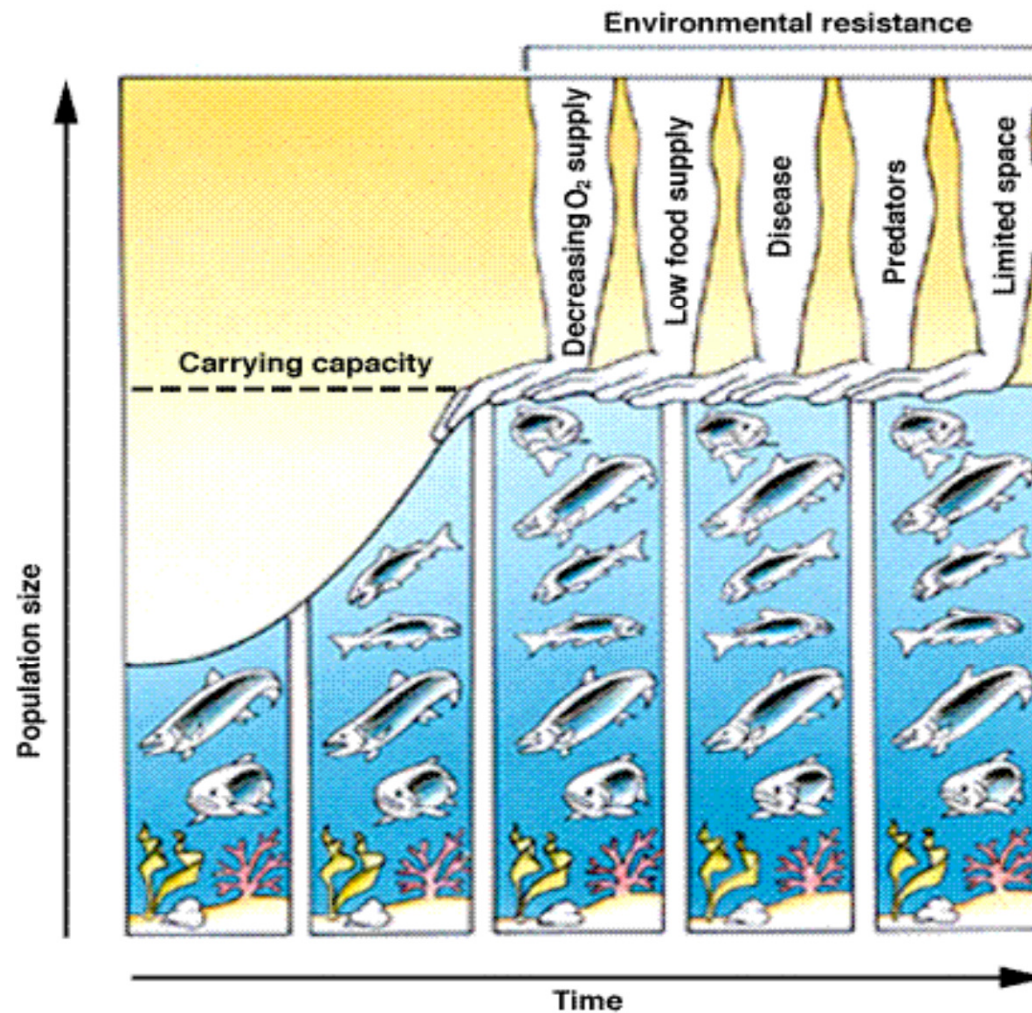
D. This occurs when:

1. Birth rate = death rate

2. Immigration = emigration

1. Carrying Capacity

The largest number of organisms that a given ecosystem can support

Carrying Capacity

Environmental resistance

Decreasing O₂ supply

Low food supply

Disease

Predators

Limited space

Carrying capacity

Population size

Time

Logistic Curve
S-Curve

Typical Population Growth Curve

Number of mice

Stable equilibrium

Exponential

Lag

Time →
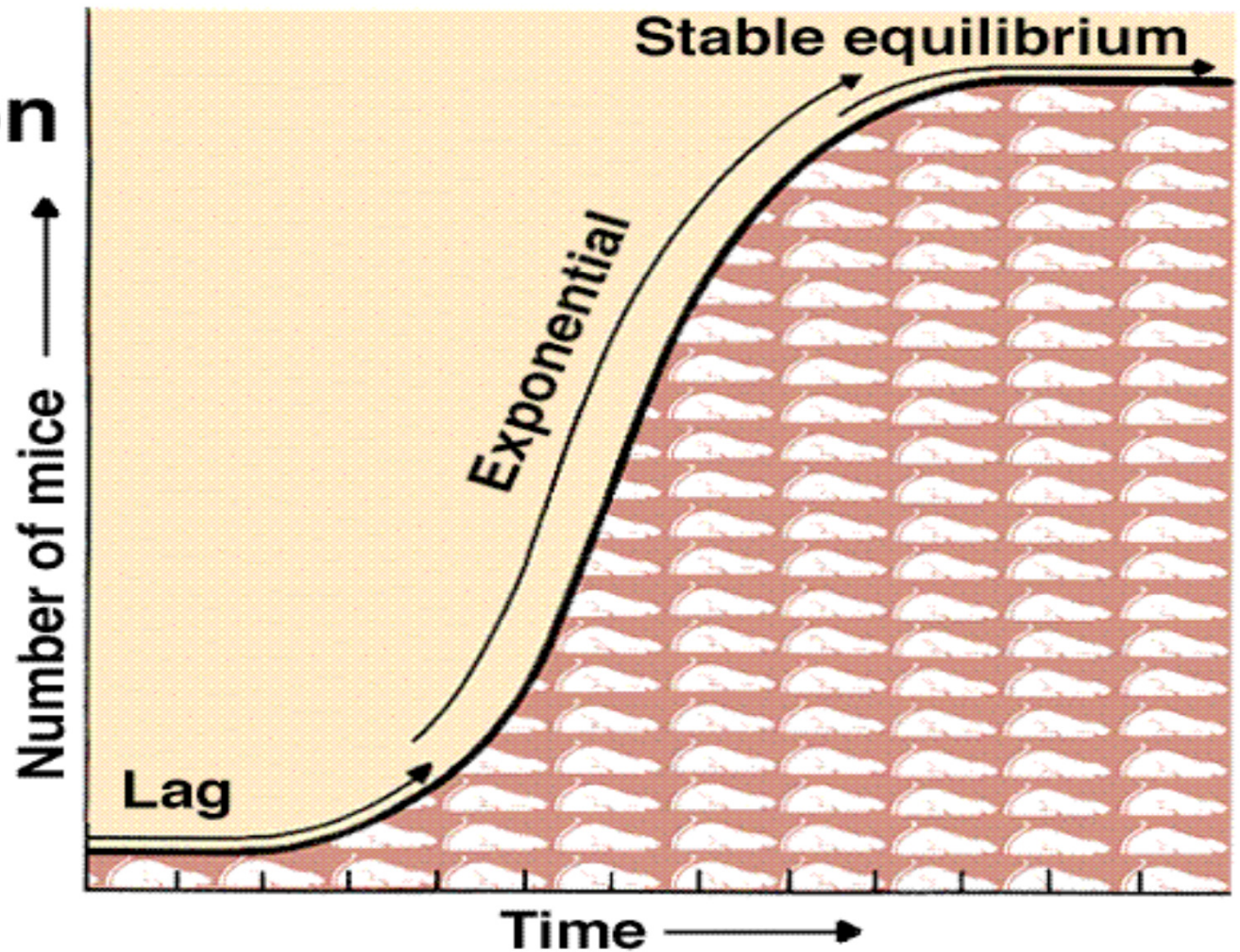
J and S population curves.

Biotic potential

Environmental resistance

Carrying capacity

Population

J curve →

← S curve

0

Time